VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor, municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260 et seq. The discharge results from the operation of a publicly owned sewage treatment plant at a highway rest area. This permit action consists of updating the permit to reflect changes in the Water Quality Standards, Guidance Memos, and the VPDES Permit Manual. SIC Code: 4952.

Facility Name: VDOT Brunswick County Rest Area

Address: 1401 East Broad Street

Richmond, VA 23219

Location Interstate I-85 Northbound – Mile Marker 32

Brunswick County, Virginia

Permit Number
 VA0061379

Existing Permit Expiration Date: October 19, 2008

Owner Contact

Name: Mr. Jacob Porter

Title: Special Facilities Program Manager, Asset

Management Divisions

Telephone No: 804-662-9615

4. Application Complete Date: June 5, 2008

Permit Drafted By:

Reviewed By:

Reviewed By:

Reviewed By:

Ray Jenkins

Jaime Bauer, Piedmont Regional Office

April 10, 2008

Date: June 11, 2008

Public Notice Dates: First Publication Date: July 30, 2008

Second Publication Date: August 6, 2008

Public Comment Period: July 30, 2008 to August 29, 2008

5. SCC Certification Verification as required by Section 62.1-44.15:3 of the State Water Control Law: Applies only to privately owned treatment works. The facility is owned by a state agency.

6. **Financial Assurance/Closure as required by 9 VAC 25-650-10:** Applies only to privately owned treatment works and does not apply to design flows greater than 40,000 gallon per day. While the design is less than 40,000 gallons per day, the facility is owned by a state agency and therefore financial assurance is not required.

7. Receiving Stream Name: Unnamed Tributary of Sturgeon Creek
Basin: Chowan and Dismal Swamp Basin

Subbasin: Chowan River

Section: 2b
Class: III
Special Standards: None

River Mile: 5AXBM002.06

 7-Day, 10-Year Low Flows:
 0.006 MGD
 0.010 cfs

 1-Day, 10-Year Low Flows:
 0.003 MGD
 0.005 cfs

 30-Day, 5-Year Low Flows:
 0.011 MGD
 0.017 cfs

 30-Day, 10-Year Low Flows:
 0.009 MGD
 0.013 cfs

 7-Day, 10-Year High Flows:
 0.029 MGD
 0.045 cfs

utfall mber	Discharge Source		Treat	ment			Flow Design Cap	pac
11.		Table 1: Waste	water F	low and	d Treatm	nent		
	Possible Interstate Effect			Interim	Limits in	n Other D	Occument	
	Private Federal	X	State	X POTV	ν	PVOTW	N. Control of the Con	
10.	Permit Characterization:							
9.	Reliability Class: (9 VAC 25-790-70)		Class	I				
8.	Operator License Requirer (9 VAC 25-790-300)	nents:	Class	IV				
	See Flow Frequency Memo	dated January 23	3, 2008	revised	March 1	18, 2008((Attachment 1)	
	1-Day, 10-Year High Flows 30-Day, 10-Year High Flow 1-Q30 Flows Harmonic Mean Flow: Tidal: On 303(d) List:		0.021 0.042 0.002 0.028 No No	MGD MGD MGD MGD	0.033 0.065 0.003 0.043	cfs cfs cfs cfs	Ü	
							0	

Outfall Number	Discharge Source	Treatment	Flow Design Capacity
001	Interstate Restroom Operation WWTP	Comminutor, screen, extended aeration, clarification, polishing pond, chlorine disinfection, and post aeration.	0.036 MGD

(See Attachment 2 for facility diagram)

12. Sewage Sludge Use or Disposal:

Sludge is pumped and hauled by Long and Associates to the Beaverdam Creek Wastewater Pump Station in Hanover County. It is then pumped to the Henrico County Water Reclamation Facility in Henrico County where it is treated.

13. Discharge Location Description:

The facility discharges to an unnamed tributary of Sturgeon Creek. See Attachment 3 for the Lawrenceville Topo Map, 041D.

14. Material Storage:

Chlorination and dechlorination tablets are stored under roof.

15. Ambient Water Quality Information:

Ambient water quality data is compiled from Sturegon Creek at station 5ASTG005.96 near the Route 712 bridge approximately 5 miles downstream from the discharge point. The monitoring station was selected upon the advice of J. Palmore, Senior Environmental Planner, DEQ Piedmont Regional Office. See Attachment 5B for monitoring data.

16. Antidegradation Review & Comments: Tier 1 Tier 2 X Tier 3

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality

standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

After April 27, 1994 but prior to April 20, 1998, the effluent discharge location was moved from an intermittent stream to a perennial stream according to notes regarding the location of the discharge at this facility from water quality planning staff person Paul Herman. However, during the 2003 permit cycle documentation by the permit writer indicated a discharge to a dry ditch and all stream flow information was assumed to be 0 MGD and designated as a Tier 1. There is no associated flow frequency documentation included with the permit fact sheet. Planning, also, does not have record that flow frequency analysis was performed for the 2003 permit re-issuance. A site visit was performed on May 6, 2008 by the permit writer and planning staff which confirmed that the discharge at the facility is to a perennial stream.

The antidegradation review begins with a Tier determination. The discharge is to an unnamed tributary to Sturgeon Creek. The unnamed tributary was not assessed during the 2006 or draft 2008 305(b)/303(d) Water Quality Assessment and therefore determined to be a Tier 2 water body. The initial permit issuance also designated the receiving stream as a Tier 2. Antidegradation restrictions are applied in the wasteload allocation analysis for toxic parameters.

The 2003-2008 permit required the permittee to conduct in-stream monitoring for an unnamed tributary of Sturgeon Creek to evaluate the effect of the facility's discharge. Despite occasional violations of the dissolved oxygen standard, planning staff reviewed monitoring data and determined that the facility has not caused "an obvious negative impact" on the unnamed tributary during the study period supporting the Tier 2 designation. (See Attachment 8 for the Stream Monitoring Data Analysis – Sturgeon Creek, UT)

17. Site Inspection: May 6, 2008. See Attachment 7.

18. Effluent Screening & Limitation Development:

EFFLUENT	BASIS	D		SCHARGE LIMITATIONS					
CHARACTERISTICS	FOR LIMITS	MONTHLY AVERAGE		WEEKLY AVERAGE		MIN	MAX		
Flow (MGD)	NA	NL		NA		NA	NL		
pH (standard units)	1,2	N/	A	NA		6.0	9.0		
BOD ₅	1	20 mg/L	2700 gms/d	30 mg/L	4100 gms/d	NA	NA		
TSS	2	30 mg/L	4100 gms/d	45 mg/L	6100 gms/d	NA	NA		
TRC	1	0.0023	mg/L	0.0029 mg/L		NA	NA		
Dissolved Oxygen	1	N/	4	NA		6.5 mg/L	NA		
Ammonia as N (Apr – Sept)	1	1.2 mg/L 1.2 mg/L		NA	NA				
Ammonia as N (Oct – Mar)	1	2.3 m	ng/L	2.3 m	ıg/L	NA	NA		

Basis for Limits

Permit limitation development for toxic pollutants began with obtaining flow frequency and stream data from the water planning group. The flow frequency data was then entered into MIX.exe to determine the proper mix to be used in the MSTRANTI spreadsheet. Effluent data were compiled from DMRs submitted regularly by the facility. The mixing ratios, effluent data, stream data, and flow frequencies were entered into the MSTRANTI spreadsheet to calculate Wasteload Allocations which were then entered into STATS.exe. See Attachment 5 for permit limitation development documents.

Water Quality-Based Limits:

pH: A pH range of 6.0 – 9.0 Standard Units is assigned to all Class III waters per the Virginia Water Quality Standards, 9 VAC 25-260-50.

Biological Oxygen Demand (BOD $_5$): Based on the October 17, 1975 Memorandum on WLA for Interstate 85 Rest Stop – Brunswick County. See Attachment 4. The BOD $_5$ effluent limit as specified in the secondary treatment standard in 40 CFR 133.102 is 30 mg/L and 45 mg/L monthly and weekly average, respectively. The BOD $_5$ limit is more stringent than the federal secondary standards due to water quality concerns.

Total Residual Chlorine (TRC): A limitation evaluation was conducted for TRC. The chronic and acute WLAs were calculated using the MSTRANTI Excel Spreadsheet. Acute and chronic WLA for TRC were calculated as 0.0051 mg/L and 0.0032 mg/L, respectively. Following the procedures in GM 00-2011, since the WLAa was less than 4.0 mg/L, the actual WLA were entered into STATS.exe to determine the need for a permit limitation and calculate the limitation. A quantification level of 0.10 mg/L and a data point of 20 mg/L were used as recommended by the VPDES permit manual. The evaluation produced recommended limitations of 0.0023 mg/L for average monthly and 0.0029 mg/L for average weekly in order to protect water quality (See Attachment 5F). No compliance schedule is being included because the facility is already demonstrating compliance with the new TRC limits as per the requirements of the Compliance Reporting Special Condition.

Dissolved Oxygen (DO): Based on the October 17, 1975 Memorandum on WLA for Interstate 85 Rest Stop – Brunswick County. See Attachment 4. The minimum DO criteria for class III waters in the Virginia Water Quality Standards (WQS) is 4.0 mg/L.

Ammonia: In the current permit (2003 cycle) the permittee is given seasonally tiered limitations based on temperature because of problems meeting ammonia limitations in winter months. The monthly in-stream monitoring data submitted by the permittee were used to define the seasonal tiers for the limitations. (Attachment 9) Data were averaged for each month and the annual average temperature calculated. The monthly averages were plotted on a chart along with the annual average temperature to determine seasonality. Based on this chart it was determined that the winter months for the facility's location are October through March.

The wasteload allocations for ammonia for annual and winter were calculated using the MSTRANTI Excel spreadsheet. The effluent average summer temperature provided by the permittee on the Form 2A permit application was used to calculate a WLA for ammonia for the summer season. The permittee also provided an average winter effluent temperature; however, that temperature only included 31 data points all from the month of January. Because the average winter temperature did not include any other months defined as part of the winter season, staff did not use this temperature for calculating the winter WLA for ammonia. Instead, a best professional judgment was made to use a default winter temperature of 14°C that is often used for modeling.

The WLAs were entered in to the STATS.exe computer application to determine the need for permit limitations and calculate the limitations. Annual acute and chronic WLAs of 3.2 mg/L and 0.65 mg/L, respectively, were entered into STATS.exe with a quantification level of 0.2 mg/L. Under winter conditions, the acute and chronic WLA's are 3.2 mg/L and 1.3 mg/L, respectively. Following procedures established in Virginia DEQ Guidance Memo 00-2011, a single datum point of 9.0 mg/L

was input into the program in each evaluation. The evaluation resulted in a recommended annual limitation of 1.3 mg/L averaged weekly and monthly and winter limitation of 2.6 mg/L averaged monthly and weekly. However, the previous permit limitations for ammonia will be carried forward in this permit reissuance due to anti-backsliding. (See Attachment 5F)

2. Federal Effluent Guidelines (Technology Based Limits)

Total Suspended Solids (TSS): Municipal facilities are required to meet secondary treatment requirements. As promulgated in 40 CFR 133, secondary treatment for TSS will meet limits of 30 mg/L for a monthly average and 45 mg/L for a weekly average.

pH: The secondary treatment standards as promulgated in 40 CFR 133.102 establish a pH range of 6.0 to 9.0 S.U.

19. Basis for Sludge Use & Disposal Requirements:

A sludge management plan for the pump and haul disposal of sludge from this facility is required according to 9 VAC 25-31-100 P. Sludge from the rest area is pumped and hauled by Long and Associates to the Beaverdam Creek Wastewater Pump Station in Hanover County. It is then pumped to the Henrico County Water Reclamation Facility in Henrico County where it is treated.

20. Antibacksliding Statement:

9VAC 25-31-220.L and DEQ Guidance Memo 00-2011, do not allow re-issued permits to contain a less stringent water-quality based effluent limitation, unless under certain specified exceptions. One such exception is when information becomes available, which was not available at the time of re-issuing the previous permit cycle (other than revised regulations, guidance, or test methods), that would have justified the application of a less stringent effluent limitation at the time of (previous) permit issuance.

During the 2003-2008 permit cycle, the facility was required to collect in-stream monitoring data. This data was used in Attachment 9 to define the months for winter and summer for the establishment of seasonal tiers for ammonia. The 2003-2008 permit included the winter and summer months as December to April and May to November, respectively. Review of the water temperature data from the in-stream monitoring indicated that the actual winter and summer seasons are October to March and April to September, respectively.

With the shift in the definition of the seasonal months in the permit, it may appear that backsliding is occurring in the months of October and November when the ammonia limitation is changing from 1.2 mg/L to 2.3 mg/L. Because the in-stream monitoring data required by the 2003-2008 permit provided water temperature data that was not previously available to define the seasons, application of a less stringent limitation is justified.

All limits are at least as stringent as in the previous permit.

21. Compliance Schedules:

Rationale: The VPDES Permit Regulation at 9 VAC 25-31-250 allows for schedules of compliance, when appropriate, which will lead to compliance with the Clean Water Act, the State Water Control Law and regulations promulgated under them.

Analysis of effluent data indicated the need to establish more stringent effluent limitations for TRC. In most circumstances when a more restrictive effluent limitation is established, it is appropriate to allow a period of time for the permittee to achieve compliance. However, the facility is already demonstrating compliance with the new permit limitation in accordance with the Compliance Reporting Special Condition. Consequently, a compliance schedule for these parameters was not given.

22. Special Conditions:

B. Additional Effluent Limitations and Monitoring Requirements

Rationale: Required by VA Water Quality Standards, 9 VAC 25-260-170 Bacteria: other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection

C.1. 95% Capacity Reopener

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 2 for all POTW and PVOTW permits

C.2. CTC, CTO Requirement

Rationale: Required by Code of Virginia, §62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

C.3. O&M Manual Requirement

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.

C.4. Materials Handling/Storage

Rationale: 9 VAC 25-31-50 A. prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia Section §62.1-44.16 and §62.1-44.17 authorizes the Board to regulate the discharge of industrial waste or other waste.

C.5. Licensed Operator Requirement

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C. and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

C.6. Reliability Class

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

C.7. Sludge Reopener

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C.4 for all permits issued to treatment works treating domestic sewage.

C.8. TMDL Reopener

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act. This reopener is included in all permits.

C.9. Compliance Reporting

Rationale: Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

C.10. Sludge Use and Disposal

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

C.11. Effluent Monitoring Frequencies

Rationale: Permittees are granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations related to the effluent limitations for which reduced frequencies were granted. If the permittees fail to maintain the previous level of performance, the baseline monitoring frequencies should be reinstated for those parameters that were previously granted a monitoring frequency reduction.

Part II, Conditions Applicable to All Permits

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

23. Changes to the Permit:

Permit Cove	r Page:								
Item		R	RATIONALE						
Initial paragra	aph	U p	Updated language to reflect current agency guidance that incorporates the permit application as part of the permit.						
Section 2 Ch	anged to 2b	U	pdated receivi tandards for th	ng stream sections e Chowan and I	on designation b Dismal Swamp F	ased on Water Quality River Basin.			
Part I.A.									
Outfall No.	Parameter Requ Changed Char		ement	Effluent Limits Changed		Reason for Change	Date		
		From	То	From	То				
	TRC	-	-	0.0080 mg/L 0.0098 mg/L	0.0023 mg/L 0.0029 mg/L	Evaluation of TRC indicated a needed for a more stringent limitation to maintain water quality.	4/08		
004	BOD5	1/Month	1/6 months	-	æ8	This facility has maintained			
001	TSS	1/Month	1/Quarter		-	performance levels that, according to guidance, qualifies it for reductions in monitoring requirements for NH ₃ , BOD ₅ , and TSS.	6/08		
FROM	то	RATION	ALE						
Ammonia (May – Nov)	Ammonia (Apr-Sept)	The mor	iths for the ami	monia limitations	s have been adju	usted to match seasonali	ty that		
Ammonia	Ammonia	appears	in monitoring t	iala submilled b	y the facility. Se	ee Attachment 9.			

(Dec – Apr)	(Oct-Mar)		
Footnote a.	Footnote (1)	Updated language to reflect current agency guidance.	
Footnote b.	Footnote (3)	Added to reflect current agency guidance.	
-	Footnote (2)	Added to reflect current agency guidance.	
Part I.A.2	Part I.A.1.a	Renumbered.	
Part I.A.3.	Part I.A.1.b	Renumbered.	

Special Cor	ndition Changes:	
FROM	то	RATIONALE
B.1.c	B.1.c	TRC Limitations and Monitoring Requirements: 0.6 mg/L changed to 0.60 mg/L to reflect significant digit guidance.
B.1.d	B. 1.d. and B.2	Renumbered.
B.2	Removed	Bacterial Limitations and Monitoring Requirements: Facility performed bacterial (E. coli) study establishing chlorination as a surrogate for bacteria monitoring and submitted data to DEQ for review in April 2004.
	C.2	CTC, CTO Requirement: New condition. Added to reflect current agency guidance.
C.2	C.3	Operations and Maintenance Manual Requirement: Updated language to reflect current agency guidance.
C.3	C.4	Materials Handling/Storage: Renumbered.
C.5	C.5	Licensed Operator Requirement: Renumbered.
C.4	C.6	Reliability Class: Renumbered.
C6	C.7	Sludge Reopener: Renumbered.
	C.8	TMDL Reopener: New condition. Added to reflect current agency guidance.
C.9	C.9	Compliance Reporting: Updated language to reflect current agency guidance on compliance reporting and significant digits.
C.7	C.10	Sludge Use and Disposal: Updated language to reflect current agency guidance. Change also reflects transfer of the program from VDH to DEQ.
	C.11	Effluent Monitoring Frequencies: New condition. Added to reflect facility's eligibility for reduced monitoring frequencies. See Attachment 6 for evaluation.
C.8	/40	Closure Plan: Removed. Language no longer included in permits per current agency guidance.
C.10		In-Stream Water Quality Monitoring: Removed. Planning staff reviewed the data and determined that the in-stream monitoring program would be discontinued. See Attachment 8.

24. Variances/Alternate Limits or Conditions:

Reduced Monitoring Frequencies: Permittees having exemplary operations that consistently meet permit requirements are considered for reduced monitoring per Guidance memorandum 98-2005 and in accordance with EPA's "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies" (EPA 833-B-96-001). The facility has consistently been in compliance with the terms and limitations of the permit and has not been a party to any enforcement action during the past three years. The facility is, therefore, eligible for reduced

monitoring frequencies evaluation. See Attachment 6 for Reduced Monitoring Frequencies Evaluation.

25. Regulation of Users (9 VAC 25-31-280 B 9):

Not Applicable - The facility is owned by a state agency.

26. Public Notice Information required by 9 VAC 25-31-280 B:

All pertinent information is on file and may be inspected, and copied by contacting:

Ms. Jaime Bauer at: Virginia DEQ Piedmont Regional Office 4949-A Cox Road Glen Allen, VA 23060 Telephone No. (804) 527-5015

Email Address: ilbauer@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

27. Additional Comments:

a. Previous Board Action: None

b. Staff Comments:

- The permittee recently submitted an environmental impact report to the DEQ for upgrades to
 the existing plant. Prior to operation and discharge from the upgraded plant, all parameters
 evaluated for this permit reissuance will need to be re-evaluated and additional parameters and
 special conditions may be required. The facility is proposing to use UV disinfection rather then
 chlorination.
- Groundwater monitoring is not typically required of polishing ponds. If at a later time it is determined that a problem may exist from the polishing pond, groundwater monitoring may be required.
- During final review of the permit package, a rounding error with regard to the total reduced chlorine limitation was discovered. Analysis of chlorine resulted in the need for a weekly average TRC limitation of 0.002858 mg/L. The limitation was rounded to 0.0028 mg/L in the version that was public noticed. The correct expression in two significant figures is 0.0029 mg/L. The final permit is being issued with a TRC limitation expressed as 0.0029 mg/L. Since the actual limitation did not change, only how it is expressed, there is no need to the permit to be sent back through the public notice process.

Also, the monitoring frequency for ammonia was changed from once per quarter and once per six months to once per month after the public comment period closed. After final permit review, staff determined that reduced monitoring was not appropriate for ammonia since the months in which the seasonal ammonia limitations changed from the previous permit cycle. In order to be eligible for reduced monitoring the facility must demonstrate compliance with the limitations. Under the changed seasonal months, that data is not yet available. The facility may be eligible for reduced monitoring frequency of ammonia during the next permit reissuance after demonstrating that they are able to meet all ammonia permit limitations in this permit. An

additional public comment period is not necessary since the monitoring frequency requirement of ammonia is increasing.

c. Public Comment: No comments received

28. 303(d) Listed Segments (TMDL):

This facility does not discharge to a stream segment that is listed on the current 303(d) list.

29. Summary of Attachments:

- 1. Flow Frequency Memorandum
- 2. Facility Diagram
- 3. Topographic Map
- 4. October 17, 1975 Memo on WLA for Interstate 85 Rest Stop Brunswick County
- 5. Permit Limit Development
 - 5A. MSTRANTI Data Source Table
 - 5B. STORET Data
 - 5C. DMR data
 - 5D. MIX.exe
 - 5E. MSTRANTI.xls
 - 5F. STATS.exe Output for TRC and NH₃
- 6. Reduced Monitoring Frequencies Evaluation
- 7. Site Visit Memorandum
- 8. Stream Monitoring Data Analysis Sturgeon Creek, UT
- 9. Temperature Data and Evaluation

Attachment 1 – Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office 4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT:

Flow Frequency Determination / 303(d) Status

VDOT L86 Brunswick Rest Area STP - VA00061379

165

TO:

Jaime Bauer

FROM:

Jennifer V. Palmore, P.G.

DATE:

January 23, 2008

REVISED:

March 18, 2008

COPIES:

File

The Virginia Department of Transportation's I-85 Brunswick Rest Area discharges to an unnamed tributary of Sturgeon Creek in Brunswick County, VA. The rivermile for the discharge is 5AXBM002.06. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

The DEQ conducted several stream flow measurements on the unnamed tributary of Sturgeon Creek directly above the I-85 outfall (Unnamed Tributary to Sturgeon Creek, near Alberta, VA #02045275) from June 1998 through June 2002. The measurements were correlated with the same day daily mean values from the USGS continuous record gauge on the Meherrin River at Emporia, VA (#02052000.) The measurements and daily mean values were plotted on a logarithmic graph and a best fit power trend line was plotted through the data points. The flow frequencies from the reference gage were plugged into the equation for the regression line to calculate the associated flow frequencies at the measurement site. The flow frequencies for the gauge and measurement site/discharge point are presented below. The regression analysis is attached.

Meherrin River at Emporia, VA (#02052000):

Drainage Area = 747 mi² Statistical period = 1986-2003

	otationean period	1700 2003
1Q30 = 4	.1 cfs	High Flow $1Q10 = 99$ cfs
1Q10 = 7	.6 cfs	High Flow $7Q10 = 155$ cfs
7Q10 = 1	8 cfs	High Flow $30Q10 = 254$ cfs
30Q10 =	28 cfs	HM = 144 cfs
2005 4	1 C	

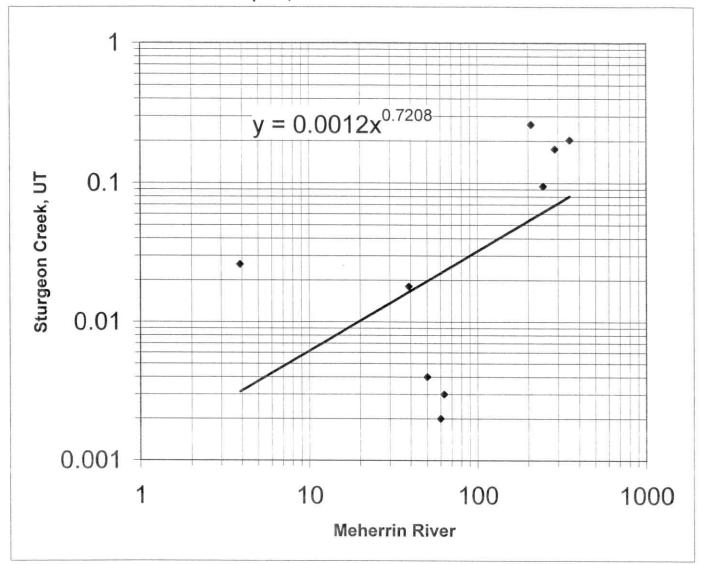
3005 = 41 cfs

Sturgeon Creek, UT:

Drainage area = 1.68 mi^2

```
1Q30 = 0.003 cfs (0.002 MGD)
1Q10 = 0.005 cfs (0.003 MGD)
7Q10 = 0.010 cfs (0.006 MGD)
30Q10 = 0.013 cfs (0.009 MGD)
30Q5 = 0.017 cfs (0.011 MGD)
High Flow 1Q10 = 0.033 cfs (0.021 MGD)
High Flow 7Q10 = 0.045 cfs (0.029 MGD)
High Flow 30Q10 = 0.065 cfs (0.042 MGD)
HM = 0.043 cfs (0.028 MGD)
```

Unnamed Tributary to Sturgeon Creek, near Alberta, VA #02045275 vs Meherrin River at Emporia, VA #02052000



Flow Data (cfs)					Flow Frequencies (cfs)		
Date	Sturgeon, UT	Meherrin			Meherrin		Sturgeon, UT
6/23/1998	0.095	245			4.1	1Q30	0.003
9/1/1998	0.002	60	SUMMARY OUTPUT		7.6	1Q10	0.005
9/14/1998	0.003	63			18	7Q10	0.010
9/28/1998	0.004	50	Regression Sta	tistics	28	30Q10	0.013
5/19/1999	0.203	352	Multiple R	0.834217	41	30Q5	0.017
8/16/1999	0.175	287	R Square	0.695918	99	HF 1Q10	0.033
5/10/2001	0.262	208	Adjusted R Square	0.652478	155	HF 7Q10	0.045
10/22/2001	0.018	39	Standard Error	0.059515	254	HF 30Q10	0.065
6/26/2002	0.026	3.9	Observations	9	144	HM	0.043
					747	DA (mi²)	1.68
					1	F Months:	lan-Anr

HF Months: Jan-Apr Period: 1986-2003

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Piedmont Regional Office 4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status

VDOT I-86 Brunswick Rest Area STP - VA00061379

TO:

Jaime Bauer

FROM:

Jennifer V. Palmore, P.G.

DATE:

January 23, 2008

COPIES:

File

The Virginia Department of Transportation's I-85 Brunswick Rest Area discharges to an unnamed tributary of Sturgeon Creek in Brunswick County, VA. The rivermile for the discharge is 5AXBN000.38. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

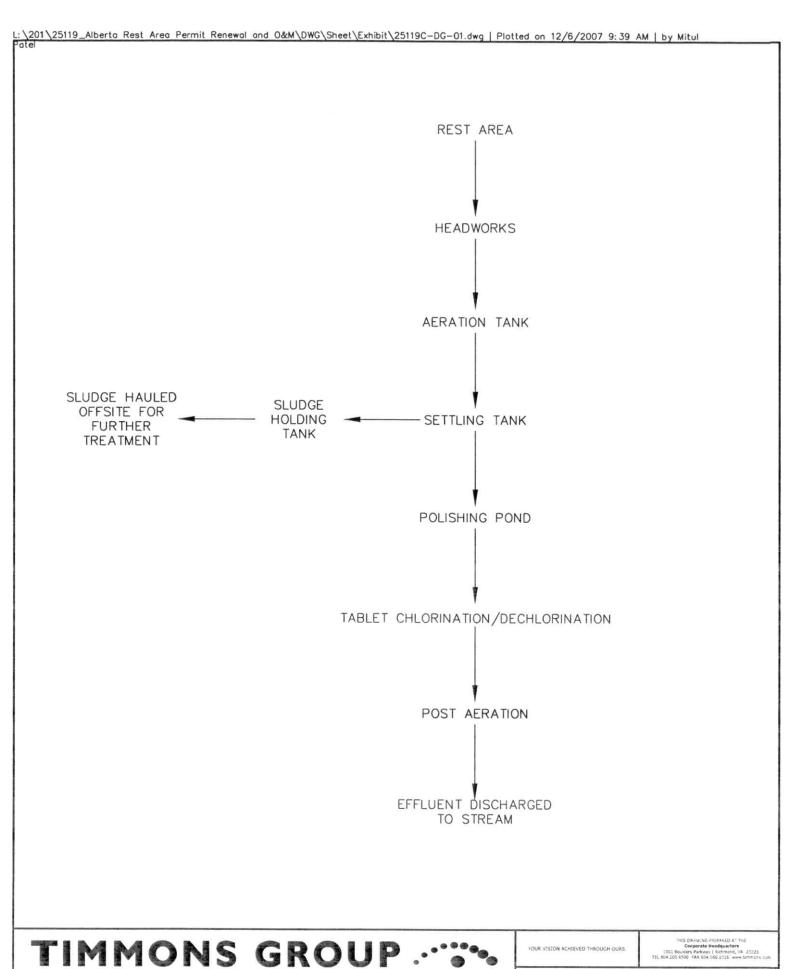
At the discharge point, the receiving stream is shown as an intermittent stream on the USGS Lawrenceville Quadrangle. The flow frequencies for dry ditches and intermittent streams are listed below:

UT to Sturgeon Creek:

	urgeon Creek.
1Q30 = 0.00 cfs	High Flow $1Q10 = 0.00$ cfs
1Q10 = 0.00 cfs	High Flow $7Q10 = 0.00$ cfs
7Q10 = 0.00 cfs	High Flow $30Q10 = 0.00$ cfs
30Q10 = 0.00 cfs	HM = 0.00 cfs
30Q5 = 0.00 cfs	

The unnamed tributary was not assessed during the 2006 305(b)/303(d) cycle. If you have any questions concerning this analysis, please let me know.

Attachment 2 - Facility Diagram



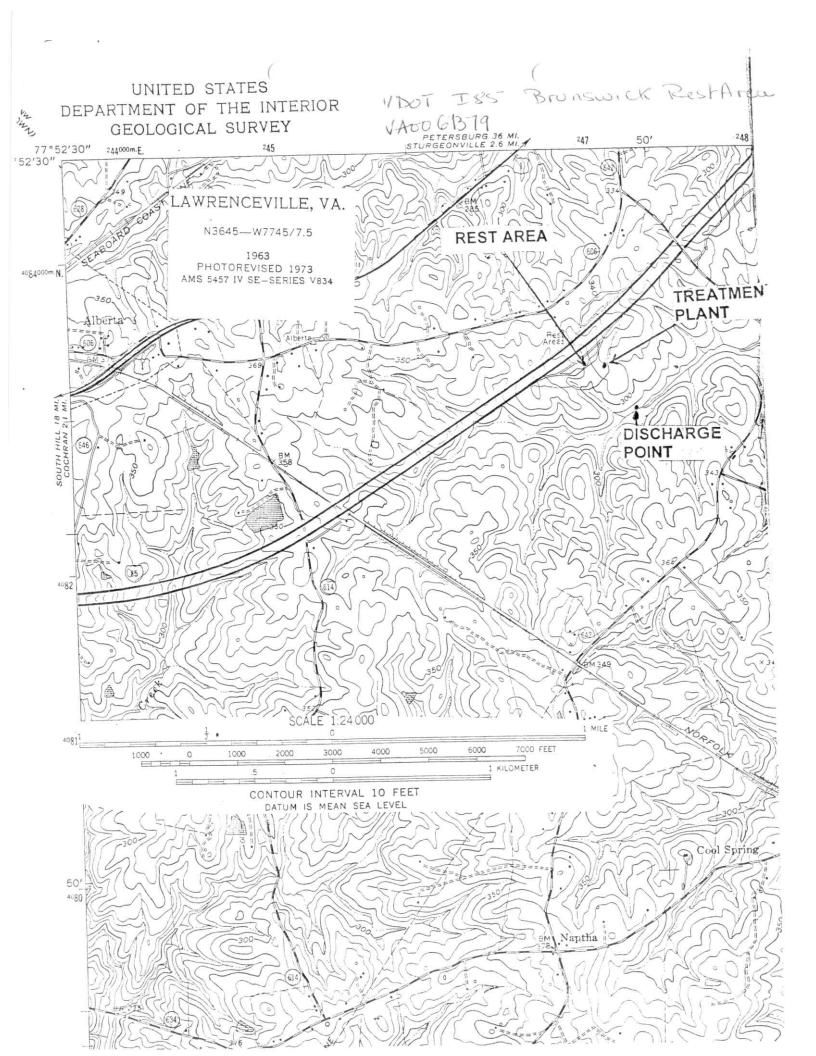
VDOT BRUNSWICK COUNTY REST AREA
BRUNSWICK COUNTY, VIRGINIA
LINE DIAGRAM

TEL 604 200, 6500 FAX 804 566, 1016 www. Infrinces. Com.

Site Development | Residential | Infrastructure | Technology

DATE | REVISION DESCRIPTION

TO SUBJECT | REVISION DESCRIPTION



Attachment 4 – October 17, 1975 Memo on WLA for Interstate 85 Rest Stop – Brunswick County

Attachment 5 – Permit Limit Development:

Attachment 5A: MSTRANTI Data Source Table

Attachment 5B: STORET Data

Attachment 5C: DMR data Attachment 5D: MIX.exe

Attachment 5E: MSTRANTI.xls

Attachment 5F: STATS.exe Output for TRC and

 NH_3

Attachment 5A: MSTRANTI DATA SOURCE REPORT

VA0061379 -VDOT I-85 Brunswick County Rest Area

Stream Information:	
Mean Hardness	STORET DATA: 5-ASTG005.96 (Attachment 5B)
90% Temperature	STORET DATA: 5-ASTG005.96 (Attachment 5B)
90% Maximum pH	STORET DATA: 5-ASTG005.96 (Attachment 5B)
10% Maximum pH	STORET DATA: 5-ASTG005.96 (Attachment 5B)
Tier Designation	As advised by planning unit.
Stream Flows:	
All Data	Flow Frequency Memorandum (Attachment 1)
Mixing Information:	
Flow Analysis	MIX.exe (Attachment 5D)
Effluent Information:	
Mean Hardness	BPJ
90% Temperature	Summer Average from Form 2A Section A.12
90% Temperature - Winter	BPJ
90% Maximum pH	DMR data (Attachment 5C)
10% Maximum pH	DMR data (Attachment 5C)
Discharge Flow	Design Flow as reported in Permit Application Form 2A

Attachment 5B - STORET Data

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler
5ASTG005.96	9/13/1990	S	.30	20.80	6.73		6.20
5ASTG005.96	12/5/1990	S	.30	6.90	7.24	10.81	10.80
5ASTG005.96	12/5/1990	В	1.00	6.92	7.24	10.81	
5ASTG005.96	3/28/1991	S	.09			9.34	
5ASTG005.96	3/28/1991	В	.30	17.79	6.68	9.34	
5ASTG005.96	6/19/1991	S	.30	22.20	6.35		6.99
5ASTG005.96	9/19/1991	S	.30	24.49	5.97	2.93	
5ASTG005.96	9/19/1991	S	304.50		0.01	2.00	
5ASTG005.96	12/19/1991	S	.30	2.02	7.03	13.63	
5ASTG005.96	3/18/1992	S	.30	10.34	5.56	10.58	
5ASTG005.96	6/22/1992	S	.30	17.97	6.12	7.50	
5ASTG005.96	9/21/1992	S	.30	21.35	6.47	4.63	
5ASTG005.96	12/8/1992	S	.30	3.63	6.86	11.98	
5ASTG005.96	3/16/1993	S	.30	4.84	5.98	12.32	
5ASTG005.96	6/9/1993	S	.30	22.67	6.34	6.95	
5ASTG005.96	9/23/1993	S	.30	19.33	6.65	3.73	
5ASTG005.96	12/15/1993	S	.30	4.78	6.60	11.95	
5ASTG005.96	3/14/1994	S	.30	10.11	6.24	10.06	
5ASTG005.96	6/13/1994	S	.30	22.05	6.62	7.15	
5ASTG005.96	9/14/1994	S	.30	17.29	6.57	5.78	
5ASTG005.96	12/19/1994	S	.30	6.92	6.76	11.10	
5ASTG005.96	3/8/1995	S	.30	12.84	6.57	9.41	
5ASTG005.96	6/6/1995	S	.30	21.07	6.54	7.08	
5ASTG005.96	9/6/1995	S	.30	18.04	6.48	1.08	
5ASTG005.96	12/6/1995	S	.30	8.21	6.56	11.05	
5ASTG005.96	3/28/1996	S	.30		6.27		
5ASTG005.96	6/17/1996	S	.30	8.21	6.27	11.04	
5ASTG005.96	9/12/1996	S	.30	22.81 21.51	6.28	7.57 7.27	
5ASTG005.96	12/18/1996	S	.30		6.22		
5ASTG005.96	3/11/1997	S		8.50	6.22	10.52	
5ASTG005.96	6/18/1997	S	.30	9.72	6.45	11.68	
5ASTG005.96	8/5/1997	S	.30	20.79			
5ASTG005.96	10/15/1997	S	.30	21.39 15.78	6.12 6.60	7.43	
5ASTG005.96	12/16/1997	S	.30	2.92	6.84	5.82	
5ASTG005.96	2/10/1998	S	.30				
5ASTG005.96			-	5.01	6.53		
5ASTG005.96	4/9/1998	S	.30	17.66			
5ASTG005.96	6/17/1998 8/26/1998	S	.30	20.73			
			.30	22.18			
5ASTG005.96	10/29/1998	S	.30	12.19			
5ASTG005.96	12/17/1998	S	.30	4.88			
5ASTG005.96	2/17/1999	S	.30	6.86			
5ASTG005.96	4/15/1999	S	.30				
5ASTG005.96	6/17/1999	S	.30				
5ASTG005.96	8/12/1999	S	.30				
5ASTG005.96	10/26/1999	S	.30				
5ASTG005.96	12/21/1999	S	.30		6.12	10.28	
5ASTG005.96	2/24/2000	S	.30				
5ASTG005.96	4/17/2000	S	.30				
5ASTG005.96	6/26/2000	S	.30				
5ASTG005.96	8/14/2000	S	.30				
5ASTG005.96	10/19/2000	S	.30	14.65	6.45	8.68	

Attachment 5B - STORET Data

Station ID	Collection Date	Depth Desc	Depth	Temp Celcius	Field Ph	Do Probe	Do Winkler
5ASTG005.96	12/14/2000	S	.30	4.69	6.62	12.37	
5ASTG005.96	2/12/2001	S	.30	5.18	6.80	11.55	
5ASTG005.96	4/9/2001	S	.30	17.60	6.37	8.10	
5ASTG005.96	2/8/2007	S	.30	2.40	6.60	13.60	
5ASTG005.96	4/17/2007	S	.30	12.20	5.80	9.80	
5ASTG005.96	6/21/2007	S	.30	20.00	6.70	7.20	
5ASTG005.96	7/31/2007	S	.30	22.10	6.40	6.10	
5ASTG005.96	10/29/2007	S	.30	11.20	7.30	6.60	
5ASTG005.96	12/27/2007	S	.30	5.60	6.10	11.10	
5ASTG005.96	2/7/2008	S	.30	12.10	7.40		
90th Percentile				22.2	6.8		
10th Percentile				4.8	6.1		

WET SI	EASON
Date	Temp Celcius
12/5/1990	6.9
12/5/1990	6.92
3/28/1991	17.79
12/19/1991	2.02
3/18/1992	10.34
12/8/1992	3.63
3/16/1993	4.84
12/15/1993	4.78
3/14/1994	10.11
12/19/1994	6.92
3/8/1995	12.84
12/6/1995	8.21
3/28/1996	8.21
12/18/1996	8.5
3/11/1997	9.72
12/16/1997	2.92
2/10/1998	5.01
4/9/1998	17.66
12/17/1998	4.88
2/17/1999	6.86
4/15/1999	13.26
12/21/1999	9.1
4/17/2000	16.97
12/14/2000	4.69
2/12/2001	5.18
4/9/2001	17.6
2/8/2007	2.4
4/17/2007	12.2
12/27/2007	5.6
2/7/2008	12.1
90th Percentile	17.033

			Attac	hment 5B - STORET	Data	00900	
						HARDNES	
						(MG/L AS	CACO3)
						Value	Com Code
Sta Id	Collection Date Time	Denth Desc	Denth	Container Id Desc	Comment	value	Com Code
5ASTG005.96	09/13/1990 13:00	S		R	STORET DATA CONVERSION	44.0	
71010000.00	12/05/1990 12:10	S		R	STORET DATA CONVERSION	28.0	
	03/28/1991 12:28	В		R	STORET DATA CONVERSION	16.0	
	06/19/1991 13:50	S		R	STORET DATA CONVERSION	36.0	
	09/19/1991 14:25	S		R	STORET DATA CONVERSION	34.0	
	12/19/1991 12:35	S		R	STORET DATA CONVERSION	54.0	
	03/18/1992 13:20	S		R	STORET DATA CONVERSION	11.0	
	06/22/1992 13:00	S		R	STORET DATA CONVERSION	24.0	
	09/21/1992 13:00	S	0.3	R	STORET DATA CONVERSION	40.0	
	12/08/1992 13:35	S	0.3	R	STORET DATA CONVERSION	20.0	
	03/16/1993 13:33	S		R	STORET DATA CONVERSION	14.0	
	06/09/1993 13:00	S		R	STORET DATA CONVERSION	18.0	
		S	0.3	R	STORET DATA CONVERSION	28.0	
	09/23/1993 15:05						-
	12/15/1993 13:31	S	0.3	R R	STORET DATA CONVERSION	22.0	
	03/14/1994 14:12 06/13/1994 13:57	S	0.3		STORET DATA CONVERSION STORET DATA CONVERSION	11.0	
		S	0.3	R		18.0	
	09/14/1994 13:00	S	0.3	R	STORET DATA CONVERSION	22.0	+
	12/19/1994 11:21	S	0.3	R	STORET DATA CONVERSION	16.0	
	03/08/1995 13:45	S	0.3	R	STORET DATA CONVERSION	16.0	
	06/06/1995 11:45	S	0.3	R	STORET DATA CONVERSION	19.0	+
	09/06/1995 10:00	S		R	STORET DATA CONVERSION	28.0	
	12/06/1995 16:15	S	0.3	R	STORET DATA CONVERSION	18.0	
	03/28/1996 13:24	S	0.3	R	STORET DATA CONVERSION	24.0	
	06/17/1996 12:12	S	0.3	R	STORET DATA CONVERSION	10.0	
	09/12/1996 10:00	S	0.3	R	STORET DATA CONVERSION	22.0	
	12/18/1996 10:22	S	0.3	R	STORET DATA CONVERSION	15.0	
	03/11/1997 10:20	S	0.3	R	STORET DATA CONVERSION	18.5	
	06/18/1997 10:30	S	0.3	R	STORET DATA CONVERSION	20.6	
	08/05/1997 11:40	S	0.3	R	STORET DATA CONVERSION	19.2	
	10/15/1997 12:22	S	0.3	R	STORET DATA CONVERSION	20.9	
	12/16/1997 14:00	S	0.3	R	STORET DATA CONVERSION	14.5	i
	02/10/1998 12:45	S	0.3	R	STORET DATA CONVERSION	11.2	
	04/09/1998 12:45	S	0.3	R	STORET DATA CONVERSION	14.1	
	06/17/1998 09:20	S	0.3	R	STORET DATA CONVERSION	16.4	
	08/26/1998 12:45	S	0.3	R	STORET DATA CONVERSION	21.7	
	10/29/1998 13:00	S	0.3		STORET DATA CONVERSION	19.0	
	12/17/1998 12:10	S		R	STORET DATA CONVERSION	17.0	
	02/17/1999 11:25	S		R		42.0	
	04/15/1999 14:00	S	0.3	R		28.0	
	06/17/1999 12:30	S		R		16.7	
	08/12/1999 12:05	S	0.3	R		20.1	
	12/21/1999 13:55	S	0.3	R	FLOW ABOVE NORMAL	16.7	7
	02/24/2000 10:00	S		R		10.0	
	04/17/2000 13:30	S	0.3	R		14.0	
	06/26/2000 13:30	S	0.3	R		15.5	
	08/14/2000 13:45	S	0.3	R	ABOVE NORMAL	12.2	
	10/19/2000 13:15	S	0.3	R	NORMAL FLOW	14.4	
	12/14/2000 12:20	S	0.3	R	NORMAL FLOW	13.1	
	02/12/2001 12:00	S	0.3	R		13.2	
	04/09/2001 11:05	S	0.3	R		9.0	
Mean	100/2001 11.00	1	1		+	19.8	+

VA0061379 - VDOT I-85 Brunswick Rest Area - DMR Data

		FLOW		рН				BOD5				TSS
		Quanti	Conc	Conc		Quanti	Conc	Conc		Quanti		Conc
Received Date	Quant Avg	Max	Min	Max	Quant Avg	Max	Avg	Max	Quant Avg		Conc Avg	Max
09-Feb-2000	0.0023299	0.016546	6.7	8	0.0045571	0.004557	14	14	0.0048826	0.0048826	15	15
10-Mar-2000	0.0039751	0.0039751	6.6	8.1	0.0045571	0.004557	14	14	0.0139969	0.0139969	43	43
11-Apr-2000	0.001637	0.014083	6.5	8	0.0009522	0.000952	18	18	0.0006877	0.0006877	13	13
11-May-2000	0.006	0.025	6	7.7	0.1878	0.1878	3	3	0.1878	0.1878	3	3
09-Jun-2000	0.004	0.022	6.7	7.8	0.007	0.007	2	2	0.01	0.01	3	3
10-Jul-2000	0.0075	0.013	6.9	8.4	0.059	0.059	3	3	0.137	0.137	7	7
10-Aug-2000	0.011	0.02	7.2	8.2	0.068	0.068	2	2	0.068	0.068	2	2
08-Sep-2000	0.009	0.013	6.9	8.3	0.04	0.04	<2.0	<2.0	0.243	0.243	6 5	5
10-Oct-2000 07-Nov-2000	0.007	0.013 0.01	7.1	8.3	0.06	0.06	4	4	0.1	0.1	3	3
08-Dec-2000	0.007	0.01	6.3	7.9	0.09	0.09	12	12	0.00	0.00	11	11
10-Jan-2001	0.007	0.021	7.2	8.3	0.23	0.23	5	5	0.08	0.08	4	4
09-Feb-2001	0.006	0.021	7.5	8.4	0.16	0.16	5	5	0.32	0.32	10	10
07-Mar-2001	0.006	0.011	7.8	8.5	0.12	0.12	7	7	0.12	0.12	7	7
06-Apr-2001	0.008	0.012	7.6	8.4	0.06	0.06	3	3	0.25	0.25	12	12
10-May-2001	0.011	0.018	7.3	8.6	0.045	0.045	2	2	0.247	0.247	11	11
08-Jun-2001	0.0107	0.0205	7.5	8.5	0.139	0.139	4	4	0.299	0.299	8.6	8.6
10-Jul-2001	0.011	0.017	7.5	8.5	<.092	<.092	<2	<2	0.439	0.439	9.5	9.5
10-Aug-2001	0.013	0.027	7.5	8	0.3	0.3	5	5		<0.06	<1	<1
10-Sep-2001	0.013	0.021	7	8.5	0.091	0.091	3	3		0.042	1.4	1.4
09-Oct-2001	0.013	0.018	6.5	8	0.454	0.454	12	12	0.28	0.28	7.4	7.4
09-Nov-2001	0.012	0.018	7.5	8	0.238	0.238	7	7	0.051	0.051	1.5	1.5
10-Dec-2001	0.015 0.013	0.029 0.027	7.5 7.9	8.5 8.5	0.076 0.114	0.076 0.114	2	3		0.114 0.288	7.6	7.6
10-Jan-2002 11-Feb-2002	0.013	0.027	7.9	8.5	<.076	<.076	<2	<2	0.257	0.257	6.8	6.8
11-Mar-2002	0.008	0.018	8	8.5	0.13	0.13	4	4		0.237	11.5	11.5
10-Apr-2002	0.008	0.012	8	8.5	0.13	0.13	9	9	150000000000000000000000000000000000000	0.574	13.3	13.3
10-May-2002	0.012	0.019	7.5	8.3	0.29	0.29	5	5	200000	0.9	15.9	15.9
10-Jun-2002	0.011	0.018	8	8	0.159	0.159	6	6		0.424	16	16
10-Jul-2002	0.01	0.016	8	8	0.492	0.492	10	10		0.743	15.1	15.1
09-Aug-2002	0.012	0.019	7.5	8.5	<0.4	0.79	<11.5	21	0.9	1.5	23.7	39.6
10-Sep-2002	0.01	0.0148	7.5	8	0.3	0.3	6	6	0.4	0.4	10.9	10.9
10-Oct-2002	0.007	0.019	8	8.5	0.06	0.06	4	4	0.04	0.04	2.8	2.8
12-Nov-2002	0.006	0.01	7.5	8.5	0.2	0.5	12.7	38	0.2	0.2	17.6	17.6
10-Dec-2002	0.007	0.016	7.5	8	0.11	0.11	6	6	0.13	0.13	7	-
10-Jan-2003	0.007			8			7	7	 			15
10-Feb-2003	0.008		7	8			14	14		0.1		8
10-Mar-2003	0.005		7.5	8		0.12	8		+			
09-Apr-2003	0.007	0.015	7.5	8		0.12	15	15	+	 	+	64
09-May-2003			7	8							9	9
10-Jun-2003	0.09						6	- 6			+	
10-Jul-2003	0.009		7.5	8		-	8	8		1	+	1;
Mar Man Edward	0.011	0.019	7.5	8		-	5	5	+		+	
11-Aug-2003	0.01	0.017	7.5			+	14	14	+		+	
09-Sep-2003	0.007	0.012	7.5	8		<0.1	<5.0	<5.0				- 4
10-Oct-2003	0.007	0.012	7.5	8		<0.1	<5.0	<5.0		+	+	
10-Nov-2003	0.0086	0.0209	7.5	8	<.0473	<0.473	<5.0	<5.0	0.0473	0.0473	+	
10-Dec-2003	0.007	0.0159	7	8	0.0908	0.0908	8	8	0.1022	0.1022	+	
12-Jan-2004	0.0055	0.0114	7.5	8	0.1855	0.1855	10	10	0.2597	0.2597	14	14
10-Feb-2004	0.0054	0.0085	7	8	0.1404	0.1404	7	7	0.2608	0.2608	13	1
10-Mar-2004	0.0069	-	7.5	8	1		6	6		+	5	
12-Apr-2004	0.0086			8	t		<ql< td=""><td><qi< td=""><td></td><td></td><td></td><td></td></qi<></td></ql<>	<qi< td=""><td></td><td></td><td></td><td></td></qi<>				
10-May-2004	0.0086			8		+	<ql< td=""><td><qi< td=""><td></td><td>+</td><td></td><td></td></qi<></td></ql<>	<qi< td=""><td></td><td>+</td><td></td><td></td></qi<>		+		
10-Jun-2004	0.0087		7.5	8		-QL	<ql< td=""><td><qi< td=""><td></td><td></td><td>+</td><td></td></qi<></td></ql<>	<qi< td=""><td></td><td></td><td>+</td><td></td></qi<>			+	
12-Jul-2004	0.0087			8		- QL	<ql< td=""><td><qi< td=""><td></td><td></td><td>+</td><td></td></qi<></td></ql<>	<qi< td=""><td></td><td></td><td>+</td><td></td></qi<>			+	
10-Aug-2004	0.01104	-		8	+	+	<ql <ql< td=""><td><qi< td=""><td>-</td><td></td><td></td><td></td></qi<></td></ql<></ql 	<qi< td=""><td>-</td><td></td><td></td><td></td></qi<>	-			

VA0061379 - VDOT I-85 Brunswick Rest Area - DMR Data

			710001		701100 E				I Data			
		FLOW		рН				BOD5				TSS
		Quanti	Conc	Conc		Quanti	Conc	Conc		Quanti		Conc
Received Date	Quant Avg	Max	Min	Max	Quant Avg	Max	Avg		Quant Avg		Conc Avg	Max
10-Sep-2004	0.0073	0.0124	7	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1431</td><td>0.1431</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1431</td><td>0.1431</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1431</td><td>0.1431</td><td>7</td><td>7</td></ql<></td></ql<>	<ql< td=""><td>0.1431</td><td>0.1431</td><td>7</td><td>7</td></ql<>	0.1431	0.1431	7	7
12-Oct-2004	0.00736	0.013	7.5	8	0.1192	0.1192	5	5	0.2623	0.2623	11	11
10-Nov-2004	0.0079	0.0189	7.5	8	0.1033	0.1033	7	7	0.1033	0.1033	7	7
10-Dec-2004	0.00705	0.013	7.5	8	0.2544	0.2544	16	16	0.4008	0.62	23.5	39
10-Jan-2005	0.0052	0.0112	7.5	8	0.4663	0.4663	11	11	0.2967	0.2967	7	7
10-Feb-2005	0.0057	0.0088	7.5	7.5	0.0977	0.0977	6	6	0.01302	0.01302	8	8
10-Mar-2005	0.00743	0.0127	7.5	8	0.2559	0.2559	13	13	0.2559	0.2559	13	13
11-Apr-2005	0.0083	0.0147	7	8	0.2706	0.2706	11	11	0.1968	0.1968	8	8
10-May-2005	0.0091	0.0167	7	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1438</td><td>0.1438</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1438</td><td>0.1438</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1438</td><td>0.1438</td><td>5</td><td>5</td></ql<></td></ql<>	<ql< td=""><td>0.1438</td><td>0.1438</td><td>5</td><td>5</td></ql<>	0.1438	0.1438	5	5
10-Jun-2005	0.00949	0.0141	7	8	0.2491	0.2491	7	7	0.4625	0.4625	13	13
11-Jul-2005	0.01095	0.0173	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.3967</td><td>0.3967</td><td>8</td><td>8</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.3967</td><td>0.3967</td><td>8</td><td>8</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.3967</td><td>0.3967</td><td>8</td><td>8</td></ql<></td></ql<>	<ql< td=""><td>0.3967</td><td>0.3967</td><td>8</td><td>8</td></ql<>	0.3967	0.3967	8	8
10-Aug-2005	0.0092	0.0139	7	8.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1325</td><td>0.1325</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1325</td><td>0.1325</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1325</td><td>0.1325</td><td>5</td><td>5</td></ql<></td></ql<>	<ql< td=""><td>0.1325</td><td>0.1325</td><td>5</td><td>5</td></ql<>	0.1325	0.1325	5	5
12-Sep-2005	0.0074	0.0116	7.5	8.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1756</td><td>0.1756</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1756</td><td>0.1756</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1756</td><td>0.1756</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.1756</td><td>0.1756</td><td>4</td><td>4</td></ql<>	0.1756	0.1756	4	4
11-Oct-2005	0.00759	0.0113	7	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0893</td><td>0.0893</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0893</td><td>0.0893</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0893</td><td>0.0893</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.0893</td><td>0.0893</td><td>4</td><td>4</td></ql<>	0.0893	0.0893	4	4
10-Nov-2005	0.0082	0.0194	7.5	8	0.1003	0.1003	5	5	0.1805	0.1805	9	9
12-Dec-2005	0.00751	0.0153	7	7.5	0.1787	0.1787	8	8	0.536	0.536	24	24
10-Jan-2006	0.0057	0.0107	7.5	7.5	0.279	0.279	11	11	0.3804	0.3804	15	15
10-Feb-2006	0.00568	0.0109	7.5	8	0.0886	0.0886	6	6	0.1329	0.1329	9	9
10-Mar-2006	0.0061	0.0103	7.5	7.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1033</td><td>0.1033</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1033</td><td>0.1033</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1033</td><td>0.1033</td><td>7</td><td>7</td></ql<></td></ql<>	<ql< td=""><td>0.1033</td><td>0.1033</td><td>7</td><td>7</td></ql<>	0.1033	0.1033	7	7
10-Apr-2006	0.0078	0.014	7.5	7.5	0.1431	0.1431	7	7	0.0613	0.0613	3	3
10-May-2006	0.0076	0.0136	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1363</td><td>0.1363</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1363</td><td>0.1363</td><td>5</td><td>5</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1363</td><td>0.1363</td><td>5</td><td>5</td></ql<></td></ql<>	<ql< td=""><td>0.1363</td><td>0.1363</td><td>5</td><td>5</td></ql<>	0.1363	0.1363	5	5
12-Jun-2006	0.0081	0.0146	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0969</td><td>0.0969</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0969</td><td>0.0969</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0969</td><td>0.0969</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.0969</td><td>0.0969</td><td>4</td><td>4</td></ql<>	0.0969	0.0969	4	4
10-Jul-2006	0.0092	0.0155	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.2067</td><td>0.2067</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.2067</td><td>0.2067</td><td>7</td><td>7</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.2067</td><td>0.2067</td><td>7</td><td>7</td></ql<></td></ql<>	<ql< td=""><td>0.2067</td><td>0.2067</td><td>7</td><td>7</td></ql<>	0.2067	0.2067	7	7
09-Aug-2006	0.0083	0.0154	7.5	8.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.5382</td><td>0.5382</td><td>18</td><td>18</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.5382</td><td>0.5382</td><td>18</td><td>18</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.5382</td><td>0.5382</td><td>18</td><td>18</td></ql<></td></ql<>	<ql< td=""><td>0.5382</td><td>0.5382</td><td>18</td><td>18</td></ql<>	0.5382	0.5382	18	18
11-Sep-2006	0.0071	0.0123	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.2793</td><td>0.2793</td><td>6</td><td>6</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.2793</td><td>0.2793</td><td>6</td><td>6</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.2793</td><td>0.2793</td><td>6</td><td>6</td></ql<></td></ql<>	<ql< td=""><td>0.2793</td><td>0.2793</td><td>6</td><td>6</td></ql<>	0.2793	0.2793	6	6
10-Oct-2006	0.0075	0.022	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0818</td><td>0.0818</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0818</td><td>0.0818</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0818</td><td>0.0818</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.0818</td><td>0.0818</td><td>4</td><td>4</td></ql<>	0.0818	0.0818	4	4
13-Nov-2006	0.00793	0.0251	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.134</td><td>0.134</td><td>6</td><td>6</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.134</td><td>0.134</td><td>6</td><td>6</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.134</td><td>0.134</td><td>6</td><td>6</td></ql<></td></ql<>	<ql< td=""><td>0.134</td><td>0.134</td><td>6</td><td>6</td></ql<>	0.134	0.134	6	6
10-Feb-2006	0.0081	0.0149	7.5	8.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<>	<ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<>	0.0693	0.0693	3	3
10-Jan-2007	0.0035	0.0116	7.5	8.5	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.056</td><td>0.056</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.056</td><td>0.056</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.056</td><td>0.056</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.056</td><td>0.056</td><td>4</td><td>4</td></ql<>	0.056	0.056	4	4
12-Feb-2007	0.0055	0.0081	7.5	8.5	0.112	0.112	8	8	0.112	0.112	8	8
12-Mar-2007	0.00691	0.0114	7.5	8	0.1908	0.1908	7	7	0.5723	0.5723	21	21
10-Apr-2007	0.00847	0.0131	7.5	8.5	0.3365	0.5325	14	21	0.5072	0.5072	20	20
10-May-2007	0.00857	0.0143	7.5	8.5	0.3952	0.3952	12	12	0.2305	0.2305	7	7
11-Jun-2007	0.0093	0.0157	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0783</td><td>0.0783</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0783</td><td>0.0783</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0783</td><td>0.0783</td><td>3</td><td>3</td></ql<></td></ql<>	<ql< td=""><td>0.0783</td><td>0.0783</td><td>3</td><td>3</td></ql<>	0.0783	0.0783	3	3
09-Jul-2007	0.01062	0.0168	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1408</td><td>0.1408</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.1408</td><td>0.1408</td><td>4</td><td>4</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.1408</td><td>0.1408</td><td>4</td><td>4</td></ql<></td></ql<>	<ql< td=""><td>0.1408</td><td>0.1408</td><td>4</td><td>4</td></ql<>	0.1408	0.1408	4	4
10-Aug-2007	0.00948	0.0148	7.5	8	0.2729	0.2729	7	7	0.9029	1.7543	23.5	45
10-Sep-2007	0.00744	0.0133	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.151</td><td>0.151</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.151</td><td>0.151</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.151</td><td>0.151</td><td>3</td><td>3</td></ql<></td></ql<>	<ql< td=""><td>0.151</td><td>0.151</td><td>3</td><td>3</td></ql<>	0.151	0.151	3	3
09-Oct-2007	0.00796	0.0141	7	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0386</td><td>0.0386</td><td>2</td><td>2</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0386</td><td>0.0386</td><td>2</td><td>2</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0386</td><td>0.0386</td><td>2</td><td>2</td></ql<></td></ql<>	<ql< td=""><td>0.0386</td><td>0.0386</td><td>2</td><td>2</td></ql<>	0.0386	0.0386	2	2
13-Nov-2007	0.00841	0.0197	7.5	8	<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<></td></ql<>	<ql< td=""><td>0.0693</td><td>0.0693</td><td>3</td><td>3</td></ql<>	0.0693	0.0693	3	3
10-Dec-2007	0.00763	0.0166	7.5	8	0.1166	0.1166	7	7	0.0666	0.0666	4	4
10-Jan-2008	0.0056	0.0109		8	0.2332	0.2332	14	14	0.1998	0.1998	12	12
AVERAGE:	0.0089736	0.0153438	7.3479	8.10313	0.1814057	0.198399	7.70952	8.42188	0.2255883	0.2466472	8.9694737	9.93158
90th Percentile:			7.5		14 118			39				
10th Percentile:			6.95									

VA0061379 - VDOT I-85 Brunswick Rest Area - DMR Data

	CI A	DO	CL2, Total	CL2, INST TECH
0	CL2,	DO	Contact	MIN LIMIT
Conc	Conc	Conc	Cone Min	Cone Min
Avg	Max 0	Min 6	Conc Min	
0	_			0.4
0	0	6.8	1	1
0	0	6.5	1.2	1.2
0	0	5 6.5	1	1
0	0	6.5	1	1
0	0	6.8	1	1
0	0	6.5	1	1
0	0	7.9	1	1
0	0	7.6	1	1
0	0	9.4	1	1
0	0	9.6	1	1
0	0	8.9	1	1
0	0	11.1	1	1
0	0	10.1	1	1
0	0	8.4	1	1
0	0	7.9	1	1.1
0	0	7.71	1.1	1.52
0	0	7.27	1.52	1.31
0	0	7.64	1.31	1.3 1.2
0	0	7.8 9.12	1.3	1.01
0	0	10	1.01	1.01
0	0	9.85	1.01	1.4
0	0	9.44	1.4	1.11
0	0	7.01	1.11	1.5
0	0	9.43	1.5	1.3
0	0	7.73	1.3	1
0	0	7.02	1	1.1
0	0	7.04	1.1	1.53
0	0	6.71	1.53	1 00
0	0	6.53	1 00	1.02
0	0	7.2	1.02	1.63
0	0	7.46	1.63	1.62
0	0	10.04	1.62	1.1
0	0	10.95	1.1	1.02
0	0	11.67	1.02	
0	0	9.86	1.01	
0	0	9.65	1.01	
0	0	9.72	1.05	
0	0	7.92	0.74	
0	0	6.64	0.8	0.8
0	0	6.71	1	1
0	0	7.4	1.03	1.03
0	0	8.39	0.86	0.86
<ql< td=""><td><ql< td=""><td>7.68</td><td>1.11</td><td>1.11</td></ql<></td></ql<>	<ql< td=""><td>7.68</td><td>1.11</td><td>1.11</td></ql<>	7.68	1.11	1.11
<ql< td=""><td><ql< td=""><td>9.91</td><td>1.02</td><td>1.02</td></ql<></td></ql<>	<ql< td=""><td>9.91</td><td>1.02</td><td>1.02</td></ql<>	9.91	1.02	1.02
<ql< td=""><td><ql< td=""><td>9.43</td><td>0.97</td><td>0.97</td></ql<></td></ql<>	<ql< td=""><td>9.43</td><td>0.97</td><td>0.97</td></ql<>	9.43	0.97	0.97
<ql< td=""><td><ql< td=""><td>10.5</td><td>1.02</td><td>1.02</td></ql<></td></ql<>	<ql< td=""><td>10.5</td><td>1.02</td><td>1.02</td></ql<>	10.5	1.02	1.02
<ql< td=""><td><ql< td=""><td>9.12</td><td>1.01</td><td>1.01</td></ql<></td></ql<>	<ql< td=""><td>9.12</td><td>1.01</td><td>1.01</td></ql<>	9.12	1.01	1.01
<ql< td=""><td><ql< td=""><td>6.85</td><td>1.04</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.85</td><td>1.04</td><td></td></ql<>	6.85	1.04	
<ql< td=""><td><ql< td=""><td>7.11</td><td>1.02</td><td></td></ql<></td></ql<>	<ql< td=""><td>7.11</td><td>1.02</td><td></td></ql<>	7.11	1.02	
<ql< td=""><td><ql< td=""><td>6.68</td><td>1.04</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.68</td><td>1.04</td><td></td></ql<>	6.68	1.04	
<ql< td=""><td><ql< td=""><td>6.92</td><td>0.82</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.92</td><td>0.82</td><td></td></ql<>	6.92	0.82	
<ql< td=""><td><ql< td=""><td>6.99</td><td>1</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.99</td><td>1</td><td></td></ql<>	6.99	1	

AMMONIA. AS N

	AMMON	IA, A5 N	
DEC	-APR	MAY	-NOV
Conc Avg	Conc Max	Conc Avg	Conc Max
		0.2	0.2
<ql< td=""><td><ql< td=""><td>0.2</td><td>0.2</td></ql<></td></ql<>	<ql< td=""><td>0.2</td><td>0.2</td></ql<>	0.2	0.2
0.23	0.23	0.11	0.11
<ql< td=""><td><ql< td=""><td>0.87</td><td>5.2</td></ql<></td></ql<>	<ql< td=""><td>0.87</td><td>5.2</td></ql<>	0.87	5.2
0.54	0.54	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
0.27	0.27	0.24	0.24
<ql< td=""><td><ql< td=""><td>0.21</td><td>0.21</td></ql<></td></ql<>	<ql< td=""><td>0.21</td><td>0.21</td></ql<>	0.21	0.21
0.33	0.33	0.29	0.29
<ql< td=""><td><ql< td=""><td>0.23</td><td>0.23</td></ql<></td></ql<>	<ql< td=""><td>0.23</td><td>0.23</td></ql<>	0.23	0.23
0.78	0.78	0.31	0.31
1.5	1.5	0.24	0.24
<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
0.85	0.85	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
1.3	1.3	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
2.05	5.2	0.81	0.81
<ql< td=""><td><ql< td=""><td>0.31</td><td>0.31</td></ql<></td></ql<>	<ql< td=""><td>0.31</td><td>0.31</td></ql<>	0.31	0.31
<ql< td=""><td><ql< td=""><td>1.13</td><td>1.5</td></ql<></td></ql<>	<ql< td=""><td>1.13</td><td>1.5</td></ql<>	1.13	1.5
0.07	0.07	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
0.24	0.24	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
<ql< td=""><td><ql< td=""><td><ql< td=""><td><ql< td=""></ql<></td></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""><td><ql< td=""></ql<></td></ql<></td></ql<>	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
0.22	0.22	0.31	0.31
0.74181818	1.028181818	<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
		0.24	0.24
		0.22	0.22
		0.33	0.33
		0.24	0.24
		<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
		<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
		<ql< td=""><td><ql< td=""></ql<></td></ql<>	<ql< td=""></ql<>
		0.36055556	0.621666667

VA0061379 - VDOT I-85 Brunswick Rest Area - DMR Data

	CL2,	DO	CL2, Total Contact	CL2, INST TECH MIN LIMIT
Conc	Conc	Conc		
Avg	Max	Min		Conc Min
<ql< td=""><td><ql< td=""><td>6.6</td><td>0.86</td><td>0.86</td></ql<></td></ql<>	<ql< td=""><td>6.6</td><td>0.86</td><td>0.86</td></ql<>	6.6	0.86	0.86
<ql< td=""><td><ql< td=""><td>7.52</td><td>0.87</td><td>0.87</td></ql<></td></ql<>	<ql< td=""><td>7.52</td><td>0.87</td><td>0.87</td></ql<>	7.52	0.87	0.87
<ql< td=""><td><ql< td=""><td>8.03</td><td>1.11</td><td>1.11</td></ql<></td></ql<>	<ql< td=""><td>8.03</td><td>1.11</td><td>1.11</td></ql<>	8.03	1.11	1.11
<ql< td=""><td><ql< td=""><td>7.93</td><td>1.1</td><td>1.1</td></ql<></td></ql<>	<ql< td=""><td>7.93</td><td>1.1</td><td>1.1</td></ql<>	7.93	1.1	1.1
<ql< td=""><td><ql< td=""><td>9.25</td><td>1.06</td><td>1.06</td></ql<></td></ql<>	<ql< td=""><td>9.25</td><td>1.06</td><td>1.06</td></ql<>	9.25	1.06	1.06
<ql< td=""><td><ql< td=""><td>11.02</td><td>1.07</td><td>1.07</td></ql<></td></ql<>	<ql< td=""><td>11.02</td><td>1.07</td><td>1.07</td></ql<>	11.02	1.07	1.07
<ql< td=""><td><ql< td=""><td>9.83</td><td>1.01</td><td>1.01</td></ql<></td></ql<>	<ql< td=""><td>9.83</td><td>1.01</td><td>1.01</td></ql<>	9.83	1.01	1.01
<ql< td=""><td><ql< td=""><td>8.6</td><td>1.05</td><td>1.05</td></ql<></td></ql<>	<ql< td=""><td>8.6</td><td>1.05</td><td>1.05</td></ql<>	8.6	1.05	1.05
<ql< td=""><td><ql< td=""><td>8.32</td><td>1.04</td><td>1.04</td></ql<></td></ql<>	<ql< td=""><td>8.32</td><td>1.04</td><td>1.04</td></ql<>	8.32	1.04	1.04
<ql< td=""><td><ql< td=""><td>6.96</td><td>1</td><td>1</td></ql<></td></ql<>	<ql< td=""><td>6.96</td><td>1</td><td>1</td></ql<>	6.96	1	1
<ql< td=""><td><ql< td=""><td>6.58</td><td>1</td><td>1</td></ql<></td></ql<>	<ql< td=""><td>6.58</td><td>1</td><td>1</td></ql<>	6.58	1	1
<ql< td=""><td><ql< td=""><td>7.08</td><td>1.06</td><td>1.06</td></ql<></td></ql<>	<ql< td=""><td>7.08</td><td>1.06</td><td>1.06</td></ql<>	7.08	1.06	1.06
<ql< td=""><td><ql< td=""><td>6.58</td><td>1.03</td><td>1.03</td></ql<></td></ql<>	<ql< td=""><td>6.58</td><td>1.03</td><td>1.03</td></ql<>	6.58	1.03	1.03
<ql< td=""><td><ql< td=""><td>7.81</td><td>1.08</td><td>1.08</td></ql<></td></ql<>	<ql< td=""><td>7.81</td><td>1.08</td><td>1.08</td></ql<>	7.81	1.08	1.08
<ql< td=""><td><ql< td=""><td>8.93</td><td>1.28</td><td>1.28</td></ql<></td></ql<>	<ql< td=""><td>8.93</td><td>1.28</td><td>1.28</td></ql<>	8.93	1.28	1.28
<ql< td=""><td><ql< td=""><td>9.63</td><td>1.16</td><td>1.16</td></ql<></td></ql<>	<ql< td=""><td>9.63</td><td>1.16</td><td>1.16</td></ql<>	9.63	1.16	1.16
<ql< td=""><td><ql< td=""><td>9.91</td><td>1</td><td>1</td></ql<></td></ql<>	<ql< td=""><td>9.91</td><td>1</td><td>1</td></ql<>	9.91	1	1
<ql< td=""><td><ql< td=""><td>9.45</td><td>1.38</td><td>1.38</td></ql<></td></ql<>	<ql< td=""><td>9.45</td><td>1.38</td><td>1.38</td></ql<>	9.45	1.38	1.38
<ql< td=""><td><ql< td=""><td>9.69</td><td>1.03</td><td>1.03</td></ql<></td></ql<>	<ql< td=""><td>9.69</td><td>1.03</td><td>1.03</td></ql<>	9.69	1.03	1.03
<ql< td=""><td><ql< td=""><td>6.74</td><td>1.05</td><td>1.05</td></ql<></td></ql<>	<ql< td=""><td>6.74</td><td>1.05</td><td>1.05</td></ql<>	6.74	1.05	1.05
<ql< td=""><td><ql< td=""><td>7.33</td><td>1.02</td><td>1.02</td></ql<></td></ql<>	<ql< td=""><td>7.33</td><td>1.02</td><td>1.02</td></ql<>	7.33	1.02	1.02
<ql< td=""><td><ql< td=""><td>7.18</td><td>1.01</td><td>1.01</td></ql<></td></ql<>	<ql< td=""><td>7.18</td><td>1.01</td><td>1.01</td></ql<>	7.18	1.01	1.01
<ql< td=""><td><ql< td=""><td>6.61</td><td>1 1 1</td><td>1 01</td></ql<></td></ql<>	<ql< td=""><td>6.61</td><td>1 1 1</td><td>1 01</td></ql<>	6.61	1 1 1	1 01
<ql <ql< td=""><td><ql <ql< td=""><td>6.89 7.48</td><td>1.01 0.87</td><td>1.01 0.87</td></ql<></ql </td></ql<></ql 	<ql <ql< td=""><td>6.89 7.48</td><td>1.01 0.87</td><td>1.01 0.87</td></ql<></ql 	6.89 7.48	1.01 0.87	1.01 0.87
≺QL <ql< td=""><td>≺QL <ql< td=""><td>8.44</td><td>1.01</td><td>1.01</td></ql<></td></ql<>	≺QL <ql< td=""><td>8.44</td><td>1.01</td><td>1.01</td></ql<>	8.44	1.01	1.01
<ql< td=""><td><ql< td=""><td>10.03</td><td>1.04</td><td>1.04</td></ql<></td></ql<>	<ql< td=""><td>10.03</td><td>1.04</td><td>1.04</td></ql<>	10.03	1.04	1.04
<ql< td=""><td><ql< td=""><td>10.34</td><td>1.02</td><td>1.02</td></ql<></td></ql<>	<ql< td=""><td>10.34</td><td>1.02</td><td>1.02</td></ql<>	10.34	1.02	1.02
<ql< td=""><td><ql< td=""><td>10.54</td><td>1.08</td><td></td></ql<></td></ql<>	<ql< td=""><td>10.54</td><td>1.08</td><td></td></ql<>	10.54	1.08	
<ql< td=""><td><ql< td=""><td>11.89</td><td>1.16</td><td></td></ql<></td></ql<>	<ql< td=""><td>11.89</td><td>1.16</td><td></td></ql<>	11.89	1.16	
<ql< td=""><td><ql< td=""><td>10.07</td><td>1.02</td><td></td></ql<></td></ql<>	<ql< td=""><td>10.07</td><td>1.02</td><td></td></ql<>	10.07	1.02	
<ql< td=""><td><ql< td=""><td>7.93</td><td>1.01</td><td>1.01</td></ql<></td></ql<>	<ql< td=""><td>7.93</td><td>1.01</td><td>1.01</td></ql<>	7.93	1.01	1.01
<ql< td=""><td></td><td></td><td>1.01</td><td></td></ql<>			1.01	
<ql< td=""><td><ql< td=""><td>6.53</td><td>1.02</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.53</td><td>1.02</td><td></td></ql<>	6.53	1.02	
<ql< td=""><td><ql< td=""><td>6.52</td><td>1.02</td><td>1</td></ql<></td></ql<>	<ql< td=""><td>6.52</td><td>1.02</td><td>1</td></ql<>	6.52	1.02	1
<ql< td=""><td><ql< td=""><td>6.56</td><td>1</td><td>1</td></ql<></td></ql<>	<ql< td=""><td>6.56</td><td>1</td><td>1</td></ql<>	6.56	1	1
<ql< td=""><td><ql< td=""><td>6.63</td><td>1.01</td><td></td></ql<></td></ql<>	<ql< td=""><td>6.63</td><td>1.01</td><td></td></ql<>	6.63	1.01	
<ql< td=""><td><ql< td=""><td>7.18</td><td>1.01</td><td></td></ql<></td></ql<>	<ql< td=""><td>7.18</td><td>1.01</td><td></td></ql<>	7.18	1.01	
<ql< td=""><td><ql< td=""><td>10.17</td><td>1.01</td><td></td></ql<></td></ql<>	<ql< td=""><td>10.17</td><td>1.01</td><td></td></ql<>	10.17	1.01	
<ql< td=""><td><ql< td=""><td>10.64</td><td>1.01</td><td></td></ql<></td></ql<>	<ql< td=""><td>10.64</td><td>1.01</td><td></td></ql<>	10.64	1.01	
<ql< td=""><td><ql< td=""><td>10.18</td><td>1.36</td><td></td></ql<></td></ql<>	<ql< td=""><td>10.18</td><td>1.36</td><td></td></ql<>	10.18	1.36	
0		50 0000000	1.0609375	

Mixing Zone Predictions for VA0061379

VDOT I-85 Rest Area Mixing Zone Predictions for Effluent Flow = 0.036 MGD Stream 7Q10 = 0.006 MGD Stream 30Q10 = 0.009 MGD Stream 1Q10 = 0.003 MGD Stream slope = 0.0038 ft/ft Stream width = 4 ft Bottom scale = 3 Channel scale = 1 Stream flows based on Flow Frequency Determination Memorandum dated January 23, 2008 and Revised March 18, 2008. Mixing Zone Predictions @ 7Q10 Depth = .0958 ft Length = 104.54 ft Velocity = .1695 ft/sec Residence Time = .0071 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used. Mixing Zone Predictions @ 30Q10 Depth = .1 ft Length = 100.78 ft Velocity = .1741 ft/sec Residence Time = .0067 days Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used. Mixing Zone Predictions @ 1Q10 Depth = .0916 ft Length = 108.66 ft Velocity = .1647 ft/sec Residence Time = .1832 hours Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for VA0061379 for High Flow

Effluent Flow = 0.036 MGD Stream 7Q10 = 0.029 MGD Stream 30Q10 = 0.042 MGD Stream 1Q10 = 0.021 MGD Stream slope = 0.0038 ft/ft Stream width = 4 ft Bottom scale = 3 Channel scale = 1

Stream flows based on Flow Frequency Determination Memorandum dated January 23, 2008 and Revised March 18, 2008.

Mixing Zone Predictions @ 7Q10

Depth = .1252 ft Length = 82.9 ft Velocity = .2008 ft/sec Residence Time = .0048 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .1401 ft Length = 75.11 ft Velocity = .2154 ft/sec Residence Time = .004 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1156 ft Length = 88.87 ft Velocity = .1908 ft/sec Residence Time = .1294 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

VDOT I-85 Rest Area Brunswick County

Permit No.: VA0061379 - Annual

UT to Sturgeon Creek Facility Name:

Receiving Stream:

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	19.8 mg/L	1Q10 (Annual) =	0.003 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	25 mg/L
90% Temperature (Annual) =	22.2 deg C	7Q10 (Annual) =	0.006 MGD	- 7Q10 Mix =	400 %	90% Temp (Annual) =	27.5 deg C
90% Temperature (Wet season) =	17,033 deg C	30Q10 (Annual) =	0.009 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	O deg C
90% Maximum pH =	6.8 SU	1Q10 (Wet season) =	MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.5 SU
10% Maximum pH =	6.1 SU	30Q10 (Wet season) =	MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	US 8
Tier Designation (1 or 2) =	2	3005 =	MGD			Discharge Flow =	0.036 MGD
Public Water Supply (PWS) Y/N? =	c	Harmonic Mean =	MGD				
Trout Present Y/N? =	c	Annual Average =	N/A MGD				
Early Life Stages Present Y/N? =	>						

Parameter	Background		Water Quality Criteria	ity Criteria		_	Wasteload Allocations	llocations		All	Antidegradation Baseline	on Baseline		Anti	Antidegradation Allocations	Allocations		2	fost Limiting	Most Limiting Allocations	
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	壬	Acute	Chronic HH	H (PWS)	Ŧ	Acute	Chronic HH (PWS)	(PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute (Chronic	HH (PWS)	Ŧ
Acenapthene	0	1	£	na	2.7E+03	£	15	na	2.7E+03	1	1	na	2.7E+02	ı	1	па 2	2.7E+02	:	1	na	2.7E+02
Acrolein	0	1	Ē	na	7.8E+02	1	1	na	7.8E+02	1	3	na	7.8E+01	ă	ì	na 7	7.8E+01	1	3	na	7.8E+01
Acrylonitrile ^C	0	1	4	na	6.6E+00	į	1	na	6.6E+00	1	1	na	6.6E-01	1	1	na 6	6.6E-01	ı	1	na	6.6E-01
Aldrin ^c	0	3.0E+00	1	na	1.4E-03	3.3E+00	t	па	1.4E-03	7.5E-01	1	na	1.4E-04	8.1E-01	Ē	na	1.4E-04	8.1E-01	ı	na	1.4E-04
(Yearly)	0	1.17E+01	2.08E+00	na		1.3E+01	2.6E+00	na	1	2.92E+00	5.21E-01	na	1	3.2E+00	6.5E-01	na	+	3.2E+00	6.5E-01	na	1
(High Flow)	0	3.20E+00	1.09E+00	па	1	3.2E+00	1.1E+00	na	1	8.01E-01	2.72E-01	na	1	8.0E-01	2.7E-01	Па	1	8.0E-01	2.7E-01	па	4
Anthracene	0	í	į.	па	1.1E+05	1	1	na	1.1E+05	1	1	na	1.1E+04	1	1	na	1.1E+04	1	1	na	1.1E+04
Antimony	0	1	1	na	4.3E+03	ı	ı	na	4.3E+03	3	3	na	4.3E+02	1	Ĩ	na 4	4.3E+02	1	:	na	4.3E+02
Arsenic	0	3.4E+02	1.5E+02	na	1	3.7E+02	1.8E+02	na	1	8.5E+01	3.8E+01	na	ţ	9.2E+01	4.4E+01	na	-	9.2E+01	4.4E+01	na	ı
Barium	0	t	ŧ	na	1	ŧ	I	na	1	E	£	na	ŧ	į.	1	na	1	1	:	na	1
Benzene ^c	0	ī	ï	na	7.1E+02	E	ı	na	7.1E+02	1	1	па	7.1E+01	1	ì	na 7	7.1E+01	:	1	na	7.1E+01
Benzidine ^G	0	r	Ē	na	5.4E-03	1	1	na	5.4E-03	1	1	na	5.4E-04	9	ï	na	5.4E-04	1	ı	na	5.4E-04
Benzo (a) anthracene ^c	0	1	1	na	4.9E-01	1	3	na	4.9E-01	1	1	na	4.9E-02	1	ī	na 4	4.9E-02	£	t	na	4.9E-02
Benzo (b) fluoranthene ^c	0	1	ï	na	4.9E-01	1	1	na	4.9E-01	ï	1	na	4.9E-02	ť	Ē	na 4	4.9E-02	1	1	na	4.9E-02
Benzo (k) fluoranthene ^c	0	1	ĩ	na	4.9E-01	£	E	na	4.9E-01	Ü	1	na	4.9E-02	1	1	na 4	4.9E-02	1	:	na	4.9E-02
Benzo (a) pyrene ^c	0	ï	ī	na	4.9E-01	1	1	na	4.9E-01	1	1	na	4.9E-02	1	3	na 4	4.9E-02	ī		па	4.9E-02
Bis2-Chloroethyl Ether	0	ı	t	na	1,4E+01	1	1	na	1.4E+01	ī	1	na	1.4E+00	ŧ	ī	na	1,4E+00	1		na	1.4E+00
Bis2-Chloroisopropyl Ether	0	ı	ä	na	1.7E+05	1	1	na	1.7E+05	t	t	na	1.7E+04	ŧ	ï	na 1	1.7E+04	ŧ	1	na	1.7E+04
Bromoform ^C	0	1	ì	na	3.6E+03	£	1	na	3.6E+03	ı	F	na	3.6E+02	1	t	na 3	3.6E+02	3		na	3.6E+02
Butylbenzylphthalate	0	Ī	Ē	na	5.2E+03	I	1	na	5.2E+03	1	3	па	5.2E+02	1	1	na 5	5.2E+02	ī	,	na	5.2E+02
Cadmium	0	8.2E-01	3.8E-01	na	1	8.9E-01	4.5E-01	na	1	2.1E-01	9.5E-02	па	1	2.2E-01	1.1E-01	па	,	2.2E-01	1.1E-01	na	ī
Carbon Tetrachloride ^C	0	1	ì	na	4.4E+01	į	1	na	4.4E+01	ī	ī	na	4.4E+00	E	E	na 4	4.4E+00	1	;	na	4.4E+00
Chlordane ^c	0	2.4E+00	4.3E-03	na	2.2E-02	2.6E+00	5.0E-03	na	2.2E-02	6.0E-01	1.1E-03	na	2.2E-03	6.5E-01	1.3E-03	na 2	2.2E-03 (6.5E-01	1.3E-03	na	2.2E-03
Chloride	0	8.6E+05	2.3E+05	na	t	9.3E+05	2.7E+05	па	1	2.2E+05	5.8E+04	na	1	2.3E+05 (6.7E+04	na	- 2	2.3E+05 (6.7E+04	na	1
TRC	0	1.9E+01	1.1E+01	na	į.	2.1E+01	1.3E+01	na	1	4.8E+00	2.8E+00	па	1	5.1E+00	3.2E+00	na	1	5.1E+00	3.2E+00	na	ĩ
Chlorobenzene	0	r	ŀ	na	2.1E+04	35	1	na	2.1E+04	3	1	na	2.1E+03	1	1	na 2	2.1E+03	1	:	na	2.1E+03

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Daramotor	Day Control of		(Aratar O	Mater Original Criteria			Mississippi	Allocations		V	Antidooradation Basalina	n Basalina		Anti	anditanolly noticeparately	Allocations		NA.	post imiting	Most I imiting Allocations	
(ua/l unless noted)	Conc	Acute	Chronic	Chronic HH (PWS)	HH HH	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	壬	Acute	Chronic HH (PWS)	4 (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ
Chlorodibromomethane ^c	0	1		na	ω,		,	na	3.4E+02	1	1		3.4E+01	1		4	_	1		na	3.4E+01
Chloroform ^c	0	1	1	na	2.9E+04	F	í	na	2.9E+04	ĺ	1		2.9E+03	f	Ü		2.9E+03	ı	ı	na	2.9E+03
2-Chloronaphthalene	0	1	ı	na	4.3E+03	0	ì	na	4.3E+03	1	ä	na	4.3E+02	ì	1	na 4	4.3E+02	1	1	na	4.3E+02
2-Chlorophenol	0	1	1	na	4.0E+02	1	1	na	4.0E+02	1	1	na	4.0E+01	I	1	na 4	4.0E+01	ä	1	na	4.0E+01
Chlorpyrifos	0	8.3E-02	4.1E-02	na	1	9.0E-02	4.8E-02	na	ï	2.1E-02	1.0E-02	na	ï	2.2E-02	1.2E-02	па	1	2.2E-02	1.2E-02	na	ı
Chromium III	0	1.8E+02	2.4E+01	1 na	Ē	2.0E+02	2.8E+01	na	ř	4.6E+01	6.0E+00	na	í.	5.0E+01	6.9E+00	na	vó	5.0E+01 6	6.9E+00	na	ı
Chromium VI	0	1.6E+01	1.1E+01	1 na	3	1.7E+01	1.3E+01	na	1	4.0E+00	2.8E+00	na	1	4.3E+00	3.2E+00	na	4	4.3E+00 3	3.2E+00	na	1
Chromium, Total	0	1	1	na	t	ī	ī	na	1	į	1	na	1	1	3	na	t	1	i	na	3
Chrysene ^c	0	1	1	na	4.9E-01	1	ï	na	4.9E-01	1	1	na	4.9E-02	I	1	na 4	4.9E-02		1	na	4.9E-02
Copper	0	3.6E+00	2.7E+00) na	1	3.9E+00	3.2E+00	na	ı	9.1E-01	6.8E-01	па	i	9.9E-01	8.0E-01	па	6	9.9E-01	8.0E-01	na	1
Cyanide	0	2.2E+01	5.2E+00) na	2.2E+05	2.4E+01	6.1E+00	a	2.2E+05	5.5E+00	1.3E+00	па	2.2E+04	6.0E+00	1.5E+00	na 2	2.2E+04 6.	6.0E+00 1	1.5E+00	na	2.2E+04
2 000	0	1	1	na	8,4E-03	t	1	na	8.4E-03	1	1	na	8.4E-04	1	1	na 8	8.4E-04	:	1	na	8.4E-04
DDE C	0	1	1	na	5.9E-03	3	1	na	5.9E-03	į	ī	na	5.9E-04	1	ī	na 6	5.9E-04	1	ı	па	5.9E-04
DDT ^c	0	1.1E+00	1.0E-03	na	5.9E-03	1.2E+00	1.2E-03	na	5.9E-03	2.8E-01	2.5E-04	na	5.9E-04	3.0E-01	2.9E-04	na	5.9E-04 3	3.0E-01 2	2.9E-04	na	5.9E-04
Demeton	0	1	1.0E-01	na	t	Ě	1.2E-01	па	1		2.5E-02	na	i	t	2.9E-02	na	ī	1	2.9E-02	na	ı
Dibenz(a,h)anthracene ^c	0	1	1	na	4.9E-01	1	1	na	4.9E-01	1	ī	na	4.9E-02	1	3	na 4	4.9E-02	1	1	na	4.9E-02
Dibutyi phthalate	0	1	1	na	1.2E+04	ı	1	na	1.2E+04	1	t	na	1.2E+03	1	1	na 1	1.2E+03	I	1	na	1.2E+03
Dichloromethane					1			1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	i.				L				L			1	L
(метлугеле спіонае)	0	1	1	na	1.6E+04	t	I	a	1.6E+04	t	1		7.6E+U3	į	1		1.6E+03	ı	1	na a	1.6E+03
1,2-Dichlorobenzene	0	ı	1	na	1.7E+04	1	Î	a	1.7E+04	1	1	na	1.7E+03	į	1	na 1	1.7E+03	ı	ī	na	1.7E+03
1,3-Dichlorobenzene	0	ī	1	na	2.6E+03	i	1	na	2.6E+03	ı	1	na	2.6E+02	ı	1	na 2	2.6E+02	ı	1	na	2.6E+02
1,4-Dichlorobenzene	0	ï	1	na	2.6E+03	ī	1	na	2.6E+03	E	t	na 2	2.6E+02	E.	1	na 2	2.6E+02	ı	1	na	2.6E+02
3,3-Dichlorobenzidine	0	į.	ť	na	7.7E-01	I	I	na	7.7E-01	Đ	t	na	7.7E-02	1	1	na 7	7.7E-02	1	1	na	7.7E-02
Dichlorobromomethane ^c	0	1	1	na	4.6E+02	1	1	na	4.6E+02	1	1	na 4	4.6E+01		1	na 4	4.6E+01	3	1	na	4.6E+01
1,2-Dichloroethane ^c	0	ï	1	na	9.9E+02	ì	ī	па	9.9E+02	1	1	na	9.9E+01		1	na 9	9.9E+01	1	;	na	9.9E+01
1,1-Dichloroethylene	0	1	1	na	1.7E+04	1	ŧ	na	1.7E+04	1	Ĭ	na	1.7E+03	Ē	£	na 1	1.7E+03	1	į	na	1.7E+03
1,2-trans-dichloroethylene	0	t	E	na	1.4E+05	ı	ţ	na	1.4E+05	ŧ	1	na 1	1.4E+04	E	E	na 1	1.4E+04	ı	ı	na	1.4E+04
2,4-Dichloraphenal	0	1	1	na	7.9E+02	1	1	na	7.9E+02	1	1	na 7	7.9E+01	1	3	na 7	7.9E+01	:	1	na	7.9E+01
2,4-Dichlorophenoxy	0	E	ŀ	па	1	t	1	au	4	1	1	na	1	1	1	na	1	1	1	па	1
1,2-Dichloropropane ^c	0	ì	1	na	3.9E+02	1	1	na	3.9E+02	1	ī	na 3	3.9E+01	1	1	na 3	3.9E+01	1	1	па	3.9E+01
1,3-Dichloropropene	0	1	1	na	1.7E+03	ı	ŧ	na	1.7E+03	ı	1	na 1	1.7E+02	ī	1	na 1	1.7E+02		ı	na	1.7E+02
Dieldrin ^c	0	2.4E-01	5.6E-02	na	1.4E-03	2.6E-01	6.5E-02	na	1.4E-03	6.0E-02	1.4E-02	na	1.4E-04	6.5E-02	1.6E-02	na 1	1.4E-04 6.	6.5E-02 1	1.6E-02	na	1.4E-04
Diethyl Phthalate	0	1	E.	па	1.2E+05	ı	ŀ	na	1.2E+05	1	1	na 1	1.2E+04	1	1	na 1	1.2E+04		1	na	1.2E+04
Di-2-Ethylhexyl Phthalate ^c	0	t	ì	na	5.9E+01	1	1	na	5.9E+01	1	į	na 5	5.9E+00	1	1	na 5	5.9E+00		1	na	5.9E+00
2,4-Dimethylphenol	0	1	1	na	2.3E+03	1	1	na	2.3E+03	t	1	na 2	2.3E+02	1	1	na 2.	2.3E+02	;	ı	na	2.3E+02
Dimethyl Phthalate	0	ĭ	Ī	na	2.9E+06	t	ŧ	па	2.9E+06	I,	ŧ,	na 2	2.9E+05	Į.	1)	na 2	2.9E+05	ŧ	1	na	2.9E+05
Di-n-Butyl Phthalate	0	1	I.	па	1.2E+04	ı	į.	na	1.2E+04	I	1	na 1	1.2E+03	1	1	na 1	1.2E+03	ŧ	1	па	1.2E+03
2,4 Dinitrophenol	0	1	1	na	1.4E+04	1	1.	na	1,4E+04	3		na 1	1.4E+03	1	1	na 1	1.4E+03	3	:	na	1.4E+03
2-Methyl-4,6-Dinitrophenol	0	1	i	na	7.65E+02	1	1	na	7.7E+02	ı	1	na 7	7.7E+01	t	ŧ		7.7E+01		:	na	7.7E+01
2,4-Dinitrotoluene c	0	ï	Î	na	9.1E+01	Ĭ	E	na	9.1E+01	É	ı	na 9	9.1E+00	K	1)	na 9	9.1E+00	1		na	9.1E+00
tetrachlorodibenzo-p-dioxin)																					
(bdd)	0	ř	Ĺ	na	1.2E-06	į	E.	na	В).	1		1.2E-07	1	1		1.2E-07	1	1	na	na
1,2-Diphenylhydrazine ^c	0	1	ı	na	5.4E+00	1	1	na	5.4E+00	1	1	na			1	na 5	_		1	па	5.4E-01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.4E-01	6.5E-02	na	2.4E+02	5.5E-02	1.4E-02	na 2	2.4E+01		1.6E-02	na 2.			1.6E-02	na	2.4E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.4E-01	6.5E-02	na	2.4E+02	5.5E-02	1,4E-02	na 2	2.4E+01	6.0E-02	1.6E-02	na 2.	2.4E+01 6.	6.0E-02 1	1.6E-02	na	2.4E+01
Endosulfan Sulfate	0	ì	1	na	2.4E+02	1	1	na	2.4E+02	1	1	na 2	2.4E+01	1	ı	na 2.	2.4E+01		1	na	2.4E+01
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	9.3E-02	4.2E-02	na	8.1E-01	2.2E-02	9.0E-03	na 8		2.3E-02	1.1E-02			2.3E-02 1	1.1E-02	na	8.1E-02
Endrin Aldehyde	0	1	1	na	8.1E-01		t)	na	8.1E-01	1	t	na 8	8.1E-02	1	1	na 8	8.1E-02		:	na	8.1E-02

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Parameter	Background		Water Quality Criteria	ity Criteria			Wasteload Allocations	Allocations			Antidegradation Baseline	on Baseline		An	Antidegradation Allocations	Allocations			Aost Limitin	Most Limiting Allocations	
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	HH (PWS)	Ξ	Acute	Chronic HH (PWS)	HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic	HH (PWS)	H
Ethylbenzene	0		I	ВП	2.9E+04	1	1	na	2.9E+04	1	1	па	2.9E+03	1	1	na	2.9E+03		:	na	2.9E+03
Fluoranthene	0	:	ī	na	3.7E+02	1	ī	na	3.7E+02	1	1	na	3.7E+01	Ĩ	È	na	3.7E+01	ı	1	na	3.7E+01
Fluorene	0	ľ	Ĭ	na	1.4E+04	ť	í.	na	1,4E+04	1	t	na	1.4E+03	ŀ	ř	na	1,4E+03	ť	E	na	1.4E+03
Foaming Agents	0	1	1	na	1	1	1	na	(9)	1	(1)	na	1	1	1	na	1		1	na	1
Guthion	0	1	1.0E-02	na	1	1	1.2E-02	na	1	ä	2.5E-03	па	3	1	2.9E-03	na	;	3	2.9E-03	na	:
Heptachlor ^c	0	5.2E-01	3.8E-03	na	2.1E-03	5.6E-01	4.4E-03	na	2.1E-03	1.3E-01	9.5E-04	na	2.1E-04	1.4E-01	1.1E-03	па	2.1E-04	1.4E-01	1.1E-03	na	2.1E-04
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	na	1.1E-03	5.6E-01	4.4E-03	na	1.1E-03	1.3E-01	9.5E-04	na	1.1E-04	1.4E-01	1.1E-03	na	1.1E-04	1.4E-01	1.1E-03	na	1.1E-04
Hexachlorobenzene	0	1	t	na	7.7E-03	f	1	a	7.7E-03	1	1	na	7.7E-04	1	1	Па	7.7E-04	1	1	na	7.7E-04
Hexachlorobutadiene ^c	0	1	1	na	5.0E+02	1	1	a	5.0E+02	1	1	na	5.0E+01	1	1	na	5.0E+01	1	1	na	5.0E+01
Hexachlorocyclohexane Alpha-BHC ^c	0	1	ī	Па	1.3E-01	I	ī	na	1.3E-01	ï	E	na	1.3E-02	ï	ř	na	1.3E-02	E	ř	na	1.3E-02
Hexachlorocyclohexane Beta-BHC ^c	c		,	2	4 6F-01		1	ď	4 6F-01	1	,	2	4 6F-02	i	1	a c	4 6F-02	1	;	na	4.6E-02
Hexachlorocyclohexane Gamma-BHC ^c (Lindane)	0	9.5E-01	na	na c	6.3E-01	1.0E+00	1	n e	6.3E-01	2.4E-01	H	na na	6.3E-02	2.6E-01	1	na		2.6E-01	1	na	6.3E-02
Hexachlorocyclopentadiene	C	1	1	60	1 7F+04	1	1	E	1.7E+04	1	i	Da	1.7E+03	1	ţ	na	1.7E+03	1	1	na	1.7E+03
Hexachloroethane	0	1	.1	e	8.9E+01		1	na	8.9E+01	1	1	a	8.9E+00	1	1	na	8.9E+00	1	1	na	8.9E+00
Hydrogen Sulfide	0	1	2.0E+00	e C	1	1	2.3E+00	na	1	1	5.0E-01	па	1	ì	5.8E-01	па	1	ī	5.8E-01	na	1
Indeno (1,2,3-cd) pyrene ^c	0	. 1	1	na	4.9E-01	1	1	na	4.9E-01	1	1	Da	4.9E-02	1	I	Па	4.9E-02	1	ī	na	4.9E-02
Iron	0	I	ı	па	i	ŧ	ı	na	1	I	ï	na	1	ï	ij	na	1)	ï	ï	na	1)
Isaphorone ^c	0	ı	E	na	2.6E+04	Ē	ľ	na	2.6E+04	É	1	na	2.6E+03	1	1	па	2.6E+03	1	1	na	2.6E+03
Kepone	0	1	0.0E+00	na	1	1	0.0E+00	na	1	1	0.0E+00	na	0	i	0.0E+00	na	1	1	0.0E+00	na	1
Lead	0	2.0E+01	2.3E+00	na	1	2.2E+01	2.7E+00	na	î	5.1E+00	5.8E-01	na	1	5.5E+00	6.7E-01	na	1	5.5E+00	6.7E-01	na	ī
Malathion	0	1	1.0E-01	na	1	ī	1.2E-01	na	1	1	2.5E-02	na	ì	ì	2.9E-02	na	í	ı	2.9E-02	na	£
Manganese	0	Ţ	1	na	E	f	1	na		1	ť	na	6	I	į.	na	1	1	1	na	ı
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.5E+00	9.0E-01	na	5.1E-02	3.5E-01	1.9E-01	na	5,1E-03	3.8E-01	2.2E-01	na	5.1E-03	3.8E-01	2.2E-01	na	5.1E-03
Methyl Bromide	0	1	1	na	4.0E+03	1	1	na	4.0E+03	1	ï	па	4.0E+02	1	1	na	4.0E+02	1	ı	na	4.0E+02
Methoxychlor	0	3	3.0E-02	na	î	1	3.5E-02	na	1	I	7,5E-03	па	1	I	8.8E-03	па	ī	;	8.8E-03	па	:
Mirex	0	1	0.0E+00	na	ŧ	Ĩ	0.0E+00	na	1	I	0.0E+00	na	É	ï	0.0E+00	na	f.	1	0.0E+00	na	
Monochlorobenzene	0	1	ľ	na	2.1E+04	ı	1	na	2.1E+04	Ü	I	na	2.1E+03	1	1	па	2.1E+03	:	ı	na	2.1E+03
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	6.1E+01	7.3E+00	na	4.6E+03	1.4E+01	1.6E+00	па	4.6E+02	1.5E+01	1.8E+00	na	4.6E+02	1.5E+01	1.8E+00	na	4.6E+02
Nitrate (as N)	0	3	ŧ	na	4	1	1	na	ī	1		na	ī	1	1	na	ï	ï	î	na	:
Nitrobenzene	0	1	1	na	1.9E+03	ī	1	na	1.9E+03	ī	ı	na	1.9E+02	î.	Į.	na	1.9E+02	ï	1	па	1.9E+02
N-Nitrosodimethylamine ^C	0	ľ	r	na	8.1E+01	į.	í	na	8.1E+01	Į.	L	па	8.1E+00	ı	1	na	8.1E+00	:	1	na	8.1E+00
N-Nitrosodiphenylamine ^c	0	E	E	na	1.6E+02	1	1	na	1.6E+02	1	1	na	1.6E+01	1	1	na	1.6E+01	ì	1	na	1.6E+01
N-Nitrosodi-n-propylamine ^C	0	1	1	na	1.4E+01	1	1	na	1.4E+01	į	ï	na	1.4E+00	t	ŧ	na	1.4E+00	ı	ı	na	1.4E+00
Parathion	0	6.5E-02	1.3E-02	na	ï	7.0E-02	1.5E-02	na	1	1.6E-02	3.3E-03	na	Ĭ.	1.8E-02	3.8E-03	na	į.	1.8E-02	3.8E-03	na	
PCB-1016	0	t	1.4E-02	na	ı	Ĭ.	1.6E-02	na	ř	t)	3.5E-03	вп	Ē	Ü	4.1E-03	na	1	ı	4.1E-03	na	:
PCB-1221	0	ť	1.4E-02	na	ľ	1	1.6E-02	na	1	1	3.5E-03	na	ä	1	4.1E-03	na	4	1	4.1E-03	na	31
PCB-1232	0	1	1.4E-02	na	ì	1	1.6E-02	na	1	J	3.5E-03	na	ï	Ĭ	4.1E-03	na	1	ï	4.1E-03	па	:
PCB-1242	0	3	1.4E-02	na	ī	ĵ	1.6E-02	па	1	į	3.5E-03	na	ī	ï	4.1E-03	па	į.	1	4.1E-03	na	:
PCB-1248	0	ŧ	1.4E-02	na	1	ı	1.6E-02	na	1	į	3.5E-03	na	ř.	ī	4.1E-03	na	Ē	1	4.1E-03	na	
PCB-1254	0		1.4E-02	na	i	t	1.6E-02	na	ı	1	3,5E-03	na	1	1	4.1E-03	па		1	4.1E-03	na	1
PCB-1260	0		1.4E-02	na	1	ı	1.6E-02	na	1	ı	3.5E-03	na	1	ī	4.1E-03	na	ı	ī	4.1E-03	na	1
PCB Total ^c	0	6	0	na	1.7E-03	1	1	na	1.7E-03	1	ii	na	1.7E-04	1	1	na	1.7E-04	1	3	na	1.7E-04

Parameter	Background		Water Quality Criteria	lity Criteria			Wasteload Allocations	llocations		A	Antidegradation Baseline	n Baseline		Ant	Antidegradation Allocations	Allocations		~	fost Limiting	Most Limiting Allocations	
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	Ŧ	Acute	Chronic HH	H (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ
Pentachlorophenol ^c	0	1.0E+01	6.1E+00	na	8.2E+01	1.1E+01	7.2E+00	na	8.2E+01	2.5E+00	1.5E+00	na	8.2E+00	2.8E+00	1.8E+00	na	8.2E+00	2.8E+00	1.8E+00	na	8.2E+00
Phenol	0	1	1	na	4.6E+06	1	1	au	4.6E+06	1	î	na ,	4.6E+05	Ę	F	na	4.6E+05	f	I	na	4.6E+05
Pyrene	0	1	1	na	1.1E+04	1	1	na	1.1E+04	3	î	na	1.1E+03	1		па	1.1E+03	1	1	na	1.1E+03
Radionuclides (pCI/I except Beta/Photon)	0	1	1	na	1	ï	1	na	I	3	i	na	1	ij	1	na	1	1	1	na	1
Gross Alpha Activity	0	ī	Ī	na	1.5E+01	1	ī	na	1.5E+01	1	ĭ	na ,	1.5E+00	1	1	na	1.5E+00	ı	1	na	1.5E+00
(mrem/yr)	0	1	1	na	4.0E+00	ì	1	na	4.0E+00	1	1	na	4.0E-01	1	1	па	4.0E-01	ı	ŧ	na	4.0E-01
Strontium-90	0	1	ī	na	8.0E+00	ī	1	na	8.0E+00	1	1	na	8.0E-01	1	1	па	8.0E-01	1	1	na	8.0E-01
Tritium	0	î	3	na	2.0E+04	1	1	na	2.0E+04	1	Ĭ	na	2.0E+03	1	1	na	2.0E+03	1	3	na	2.0E+03
Selenium	0	2.0E+01	5.0E+00	na	1.1E+04	2.2E+01	5.8E+00	na	1.1E+04	5.0E+00	1.3E+00	na	1.1E+03	5.4E+00	1.5E+00	na	1.1E+03	5.4E+00	1.5E+00	na	1.1E+03
Silver	0	3.2E-01	ľ	na	l)	3.4E-01	I,	na	1	7.9E-02	ť	na	ť	8.6E-02	T.	na	ı	8.6E-02	ŧ	na	ı
Sulfate	0	1	1	па	1)	1	na	1	1	1	a	1		1	na	1	1	1	na	1
1,1,2,2-Tetrachloroethane	0	ŧ	1	na	1.1E+02	I		na	1.1E+02	1	I	na	1.1E+01	1	1	na	1.1E+01		1	na	1.1E+01
Tetrachloroethylene ^c	0	ī	ī	na	8.9E+01	1	1	na	8.9E+01	1	1	na	8.9E+00	1	1	na	8.9E+00	:	:	na	8.9E+00
Thallium	0	Ē	E	na	6.3E+00	1	1	na	6.3E+00	É	E.	na	6.3E-01	E.	į.	па	6.3E-01	Ę	:	na	6.3E-01
Toluene	0	t	ı	na	2.0E+05	ŧ	1	na	2.0E+05	1	1	na 2	2.0E+04	1	1	na	2.0E+04	;	1	na	2.0E+04
Total dissolved solids	0	1		na	1	1	;	na	1	1	31	na	1	3	4	na	1			na	:
Toxaphene ^c	0	7.3E-01	2.0E-04	na	7.5E-03	7.9E-01	2.3E-04	па	7.5E-03	1.8E-01	5.0E-05	na	7.5E-04	2.0E-01	5.8E-05	па	7.5E-04	2.0E-01	5.8E-05	па	7.5E-04
Tributyitin	0	4.6E-01	6.3E-02	na	ŧ	5.0E-01	7.4E-02	na	1	1.2E-01	1.6E-02	na	t	1.2E-01	1.8E-02	na	1	1.2E-01	1.8E-02	na	ı
1,2,4-Trichlorobenzene	0	ń	1	na	9.4E+02	1	1	na	9.4E+02	1	1	na 8	9.4E+01	1	t	na	9.4E+01	1	1	na	9.4E+01
1,1,2-Trichloroethane ^c	0	1	3	na	4.2E+02	3	3	na ,	4.2E+02	1	1	na 4	4.2E+01	1	1	na	4.2E+01	;	1	na	4.2E+01
Trichloroethylene ^c	0	1	1	na	8.1E+02	1	1	na	8.1E+02	ŧ	1	na 8	8.1E+01	:	ı	па	8.1E+01	ı	1	na	8.1E+01
2,4,6-Trichlorophenol ^c	0	i	ï	na	6.5E+01	ŧ	ţ	na (6.5E+01	£	1	na 6	6.5E+00	ı	Ē	na	6.5E+00	£	£	na	6.5E+00
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	1	1	na	ı	1	I	na	1	ī	1	па	ŧ	ε	Ē	па	1	:	1	na	ı
Vinyl Chloride ^c	0	1	ī	na	6.1E+01	18	Ę	na (6.1E+01	ı	£	na 6	6.1E+00	£	E	na	6.1E+00	1	ı	na	6.1E+00
Zinc	0	3.6E+01	3.6E+01	na	6.9E+04	3.9E+01	4.3E+01	na	6.9E+04 9	9.1E+00	9.1E+00	na 6	6.9E+03	9.8E+00	1.1E+01	na	6.9E+03	9.8E+00	1.1E+01	na	6.9E+03

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- as micrograms/liter (ug/l), unless noted otherwise
- 2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- 3. Metals measured as Dissolved, unless specified otherwise
- 4. "C" indicates a carcinogenic parameter
- 5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
- 6. Antideg. Baseline = (0.25(WQC background conc.) + background conc.) for acute and chronic
- = (0.1(WQC background conc.) + background conc.) for human health
- 7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 3QQ5 for Non-carcinogens,
 - Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Note: do not use QL's lower than the	minimum QL's provided in agency	guidance													
Target Value (SSTV)	4.3E+02	2.6E+01	na	6.7E-02	4.2E+00	1.7E+00	3.9E-01	па	4.0E-01	na	5.1E-03	1.1E+00	8.8E-01	3.4E-02	3.9E+00
Metal	Antimony	Arsenic	Barium	Cadmium	Chromium III	Chromium VI	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Zinc

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

VDOT I-85 Rest Area Brunswick County Facility Name:

Permit No.: VA0061379 - Winter

UT to Sturgeon Creek Receiving Stream:

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	19.8 mg/L	1Q10 (Annual) =	0.003 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO3) =	25 mg/L
90% Temperature (Annual) =	22.2 deg C	7Q10 (Annual) =	0.006 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	14 deg C
90% Temperature (Wet season) =	17.033 deg C	30Q10 (Annual) =	0.009 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	O geb
90% Maximum pH =	6.8 SU	1Q10 (Wet season) =	MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.5 SU
10% Maximum pH =	6.1 SU	30Q10 (Wet season) =	MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	NS 8
Tier Designation (1 or 2) =	2	3005 =	MGD			Discharge Flow =	0.036 MGD
Public Water Supply (PWS) Y/N? =	c	Harmonic Mean =	MGD				
Trout Present Y/N? =	c	Annual Average =	N/A MGD				
Farly Life Stades Present Y/N? =	>						

Parameter	Background		Water Quality Criteria	lity Criteria		,	Wasteload Allocations	Allocations		A	Antidegradation Baseline	n Baseline		Anti	Antidegradation Allocations	Allocations		M	ost Limiting	Most Limiting Allocations	
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	王	Acute	Chronic HH	H (PWS)	Ξ	Acute	Chronic	HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	(PWS)	Ŧ	Acute	Chronic	HH (PWS)	Ŧ
Acenapthene	0	1	1	na	2.7E+03	ī	ī	na	2.7E+03	£	1	na	2.7E+02	I	1	na 2.	2.7E+02	r	Ē	na	2.7E+02
Acrolein	0	i.	Ē	na	7.8E+02	1	f	na	7.8E+02	1	1	na	7.8E+01	1	1	na 7.	7.8E+01	ı	1	па	7.8E+01
Acrylonitrile ^C	0	1	1	na	6.6E+00	1	1	na	6.6E+00	1	1	na	6.6E-01	1	3	na 6	6.6E-01	1	1	na	6.6E-01
Aldrin ^C	0	3.0E+00	1	na	1.4E-03	3.3E+00	I	na	1.4E-03	7.5E-01	í	na	1.4E-04	8.1E-01	1	na 1	1.4E-04 8	8.1E-01	ı	na	1.4E-04
(Yearly)	0	1.17E+01	4.18E+00	na	Ê	1.3E+01	5.2E+00	na	1	2.92E+00 1.05E+00	1.05E+00	na	ī	3.2E+00	1,3E+00	na	1	3.2E+00 1	1.3E+00	na	1
(High Flow)	0	3.20E+00	1.09E+00	na	ī	3.2E+00	1.1E+00	na	Î	8.01E-01	2.72E-01	na	ľ	8.0E-01	2.7E-01	na		8.0E-01	2.7E-01	na	
Anthracene	0	1	É	пa	1.1E+05	1	1	na	1.1E+05	I	1	na	1.1E+04	T,	1	na 1,	1.1E+04	1	1	na	1.1E+04
Antimony	0	6	1	вп	4.3E+03	ı	1	na	4.3E+03	1	1	na	4.3E+02	3	1	na 4.	4.3E+02	ì	1	na	4.3E+02
Arsenic	0	3.4E+02	1.5E+02	na	1	3.7E+02	1.8E+02	na	1	8.5E+01	3.8E+01	na	1	9.2E+01	4.4E+01	na	6	9.2E+01 4	4.4E+01	na	:
Barium	0	1	1	na	1	ı	1	na	I	1	I	na	ī	£	Ţ.	na	1	ı	ı	na	
Benzene ^c	0	1	1	na	7.1E+02	ř	Ü	na	7.1E+02	ı	1	na	7.1E+01	ı,	1	na 7.	7.1E+01	1	1	na	7.1E+01
Benzidine ^C	0	ï	E	na	5.4E-03	ï	t	na	5.4E-03	1	1	na	5.4E-04	3		na 5	5.4E-04	1	3	na	5.4E-04
Benzo (a) anthracene ^c	0	1	1	na	4.9E-01	1	1	na	4.9E-01	1	1	na	4.9E-02	3	ı	na 4	4.9E-02	ī	1	na	4.9E-02
Benzo (b) fluoranthene ^c	0	1	1	na	4.9E-01	ī	1	na	4.9E-01	I	1	na	4.9E-02	1	ŧ	na 4	4.9E-02	1	į	na	4.9E-02
Benzo (k) fluoranthene ^c	0	ī	1	na	4.9E-01	Í	1	na	4.9E-01	£	ī	na	4.9E-02	ij	T.	na 4	4.9E-02	1	1	na	4.9E-02
Benzo (a) pyrene ^C	0	ï	£	na	4.9E-01	ř	1	na	4.9E-01	1	ı	na	4.9E-02	1	1	na 4	4.9E-02	1	1	па	4.9E-02
Bis2-Chloroethyl Ether	0	1	Ī	a	1.4E+01	1	1	na	1.4E+01	3	1	na	1.4E+00	3	3	na 1.	1.4E+00	1	1	na	1.4E+00
Bis2-Chloroisopropyl Ether	0	1	π	na	1.7E+05	ì	1	na	1.7E+05	1	Ĭ	na	1.7E+04	4	1	na 1.	1.7E+04	ı	1	na	1.7E+04
Bromoform ^C	0	â	1	na	3.6E+03	1	1	па	3.6E+03	1	I	na	3.6E+02	ŧ	1	na 3.	3.6E+02	T.		na	3.6E+02
Butylbenzylphthalate	0	1	E	na	5.2E+03	1	I	na	5.2E+03	ı	É	na	5.2E+02	1	1	na 5.	5.2E+02	1	1	na	5.2E+02
Cadmium	0	8.2E-01	3.8E-01	na	t	8.9E-01	4.5E-01	na	1	2.1E-01	9.5E-02	na	i i	2.2E-01	1.1E-01	na	1	2.2E-01	1.1E-01	na	:
Carbon Tetrachloride ^C	0	1	1	na	4.4E+01	ij	į.	na	4.4E+01	1	1	na	4.4E+00	1	1	na 4.	4.4E+00	ı	1	na	4.4E+00
Chlordane ^c	0	2.4E+00	4.3E-03	na	2.2E-02	2.6E+00	5.0E-03	na	2.2E-02	6.0E-01	1.1E-03	na	2.2E-03	6.5E-01	1.3E-03	na 2.	2.2E-03 6	6.5E-01	1.3E-03	па	2.2E-03
Chloride	0	8,6E+05	2.3E+05	na	I	9.3E+05 2	2.7E+05	пa	1	2.2E+05	5.8E+04	na	1	2.3E+05 (6.7E+04	na	1 23	2.3E+05 6	6.7E+04	na	E
TRC	0	1.9E+01	1.1E+01	na	ı	2.1E+01 1	1.3E+01	na	i.	4.8E+00	2.8E+00	па	The state of the s	5.1E+00	3.2E+00	na	1	5.1E+00 3	3.2E+00	na	1
Chlorobenzene	0	1	ı	na	2.1E+04	I	1	na	2.1E+04	1	1	na	2.1E+03	3	9	na 2.	2.1E+03	1	3	na	2.1E+03

- Common C	Bankaranad		Motor O	Mater Ouelity Criteria			Wasteload Allocations	Allocations		A	Antidegradation Baseline	n Baseline		Ant	Antidegradation Allocations	Allocations		2	Most Limiting Allocations	Allocations	
(uq/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	H	Acute	Chronic	HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	壬	Acute	Chronic HH (PWS)	IH (PWS)	H
Chlorodibromomethane	0	ı	,	na	e,	1	4	na	3.4E+02	ī	1	na	3.4E+01	Ĕ	ı	na	3.4E+01	í	ı	na	3.4E+01
Chloroform ^c	0	1	1	na	2.9E+04	1	1	na	2.9E+04	1	Ē	na	2.9E+03	ı	ı	na	2.9E+03	1	1	na	2.9E+03
2-Chloronaphthalene	0	E	1	na	4.3E+03	- (1)	i	na	4.3E+03	ı	1	na	4.3E+02	1	1	na	4.3E+02	1	1	na	4.3E+02
2-Chlorophenol	0	1	1	na	4.0E+02	1	ä	па	4.0E+02	1	1	na	4.0E+01	1	ı	na	4.0E+01	1	1	na	4.0E+01
Chlorpyrifos	0	8.3E-02	4,1E-02	na	1	9.0E-02	4.8E-02	na	1	2.1E-02	1.0E-02	na	ï	2.2E-02	1.2E-02	na	ī	2.2E-02	1.2E-02	na	ı
Chromium III	0	1.8E+02	2.4E+01	na	ı	2.0E+02	2.8E+01	na	Ĩ	4.6E+01	6.0E+00	na	ï	5.0E+01	6.9E+00	na	1	5.0E+01	6.9E+00	na	į.
Chromium VI	0	1.6E+01	1.1E+01	na	1	1.7E+01	1.3E+01	na	1	4.0E+00	2.8E+00	na	1	4.3E+00	3.2E+00	na	1	4.3E+00	3.2E+00	na	:
Chromium, Total	0	1	1	na	1	1	1	an	1	1	1	na	1	1	1	na	1		1	na	3
Chrysene ^c	0	1	1	na	4.9E-01	1	1	na	4.9E-01	1	3	na	4.9E-02	ä	1	па	4.9E-02	1	1	na	4.9E-02
Copper	0	3.6E+00	2.7E+00		1	3.9E+00	3.2E+00	na	1	9.1E-01	6.8E-01	na	1	9.9E-01	8.0E-01	na	1	9.9E-01	8.0E-01	na	į
Cvanide	0	2.2E+01	5.2E+00) na	2.2E+05		6.1E+00	па	2.2E+05	5.5E+00	1.3E+00	па	2.2E+04	6,0E+00	1.5E+00	na	2.2E+04	6.0E+00	1.5E+00	na	2.2E+04
2 DDD c	0	1	1	na	8.4E-03	_	1	na	8.4E-03	1	E	na	8.4E-04	1	1	na	8.4E-04	1	1	na	8.4E-04
DDE c	0	I,	ı	na	5.9E-03	1	1	na	5.9E-03	1	1	na	5.9E-04	1	ī	na	5.9E-04	1	1	na	5.9E-04
DDT c	0	1.1E+00	1.0E-03	na	5.9E-03	1.2E+00	1.2E-03	na	5.9E-03	2.8E-01	2.5E-04	na	5.9E-04	3.0E-01	2.9E-04	na	5.9E-04	3.0E-01	2.9E-04	na	5.9E-04
Demeton	0	1	1.0E-01	na	1	1	1.2E-01	na	ı	I	2.5E-02	na		ï	2.9E-02	na	1	I.	2.9E-02	na	1
Dibenz(a,h)anthracene ^c	0	1	1	na	4.9E-01	1	1	a	4.9E-01	Ī	ı	па	4.9E-02	1	ij	na	4.9E-02	1	1	na	4.9E-02
Dibutyl phthalate	0	1	ļ	na	1.2E+04	I.	Ē	a	1.2E+04	t	1	na	1.2E+03	1	1	па	1.2E+03	1	1	na	1.2E+03
Dichloromethane																					
(Methylene Chloride) ^C	0	3	1	na	1.6E+04	1	1	na	1.6E+04	ī	E	na	1.6E+03	É	Ü	na	1.6E+03	ı	1	na	1.6E+03
1,2-Dichlorobenzene	0		ı	na	1.7E+04	Ī	ı	na	1.7E+04	Ê	1	na	1.7E+03	1	1	na	1.7E+03	;	1	na	1.7E+03
1,3-Dichlorobenzene	0	ť	ij	na	2.6E+03	1	1	e	2.6E+03	1	1	na	2.6E+02	î	1	na	2.6E+02	1	ī	na	2.6E+02
1,4-Dichlorobenzene	0	1	3	na	2.6E+03	1	1	na	2.6E+03	1	1	na	2.6E+02	ī	1	na	2.6E+02	Ē	1	na	2.6E+02
3,3-Dichlorobenzidine ^c	0	1	1	na	7.7E-01	ī	ī	na	7.7E-01	ī	Ě	na	7.7E-02	í	1	na	7.7E-02	1	1	na	7.7E-02
Dichlorobromomethane ^c	0	ı	ŧ	na	4.6E+02	Ē	1	na	4.6E+02	Ê	1	na	4.6E+01	1	1	na	4.6E+01	1	;	na	4.6E+01
1,2-Dichloroethane ^c	0	F	ı	na	9.9E+02	J	1	na	9.9E+02	1	1	na	9.9E+01	ï	1	na	9.9E+01	:	1	na	9.9E+01
1,1-Dichloroethylene	0	1	1	na	1.7E+04	1	1	na	1.7E+04	1	ī	na	1.7E+03	ī	I	na	1.7E+03	1	1	na	1.7E+03
1,2-trans-dichloroethylene	0	9		na	1.4E+05	1	ī	na	1.4E+05	I	1	na	1.4E+04	í	ı	na	1.4E+04		É	na	1.4E+04
2,4-Dichlorophenol	0	1	1	na	7.9E+02	Ī	ĭ	па	7.9E+02	ľ	ı	na	7.9E+01	ı.	1	na	7.9E+01	1	1	na	7.9E+01
2,4-Dichlorophenoxy	C	1	,	C	1	1	1	ВП	1	I	1	na	V	ř	t	na	1	1	1	na	1
acetic acid (2,4-D)	0 0	1	;	i eu	3.9E+02	1	ï	a	3.9E+02	I	1	na	3.9E+01	1	į	na	3.9E+01	1	1	na	3.9E+01
1.3-Dichloropropene	0			i e	1.7E+03	:	1	na	1.7E+03	1	1	na	1.7E+02	Î	1	na	1.7E+02	1	ï	na	1.7E+02
Dieldrin ^c	0	2.4E-01	5.6E-02		1.4E-03	2.6E-01	6.5E-02	a	1.4E-03	6.0E-02	1.4E-02	na	1.4E-04	6.5E-02	1.6E-02	na	1.4E-04	6.5E-02	1.6E-02	na	1.4E-04
Diethyl Phthalate	0	4	3	na	1.2E+05	ī	1	na	1.2E+05	I	ï	na	1.2E+04	i	į.	na	1.2E+04	1	1	na	1.2E+04
Di-2-Ethylhexyl Phthalate ^c	0	1	*	na	5.9E+01	F	r	a	5.9E+01	Î	1	na	5.9E+00	T	1	па	5.9E+00	1	1	na	5.9E+00
2,4-Dimethylphenol	0	E	1	na	2.3E+03	1	1	na	2.3E+03	Ĵ	1	na	2.3E+02	t	1	na	2.3E+02	:	ı	na	2.3E+02
Dimethyl Phthalate	0	I	1	na	2.9E+06	1	1	па	2.9E+06	ì	î	na	2.9E+05	ī	ī	na	2.9E+05	ī	ī	na	2.9E+05
Di-n-Butyl Phthalate	0	1		na	1.2E+04	1	ï	au	1.2E+04	I	1	na	1.2E+03	î	ī	na	1.2E+03		I	na	1.2E+03
2,4 Dinitrophenol	0	3	1	na	1.4E+04	1	ī	na	1.4E+04	ï	ī	па	1.4E+03	1	1	na	1.4E+03	1	1	na	1.4E+03
2-Methyl-4,6-Dinitrophenol	0	1	ŧ	na	7.65E+02	1	ı	a	7.7E+02	1	1	па	7.7E+01	ı	ī	na	7.7E+01	1	1	na	7.7E+01
2,4-Dinitrotoluene ^c	0	E	t	na	9.1E+01	1	1	na	9.1E+01	1	ī	na	9.1E+00	t	I	na	9.1E+00	ı	ı	na	9.1E+00
tetrachlorodibenzo-p-dioxin)																	1				
(bdd)	0	ľ	1	na	1.2E-06	1	1	e e	па	Ī	1	na	1.2E-07	ì	Î		1.2E-07	Ĺ	1	na	na
1,2-Diphenylhydrazine ^c	0	1	1	na	5,4E+00	1	ī	na	5.4E+00	ī	Ĕ	na	5.4E-01	ř	t		_		1	па	5.4E-01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.4E-01	6.5E-02	a	2.4E+02	5.5E-02	1.4E-02	na	2.4E+01	6.0E-02	1.6E-02	na			1.6E-02	na	2.4E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	2.4E+02	2.4E-01	6.5E-02	na	2.4E+02	5.5E-02	1.4E-02	na	2.4E+01	6.0E-02	1.6E-02			6.0E-02	1.6E-02	na	2.4E+01
Endosulfan Sulfate	0	į	£	na	2.4E+02	Ē	ř.	na	2.4E+02	1	1		2.4E+01	1	I		_		1	na	2.4E+01
Endrin	0	8.6E-02	3.6E-02	na	8.1E-01	9.3E-02	4.2E-02	na	8.1E-01	2.2E-02	9.0E-03		8.1E-02	2.3E-02	1.1E-02			2.3E-02	1.1E-02	na	8.1E-02
Endrin Aldehyde	0	1	d.	na	8.1E-01	,	1	na	8.1E-01	1	1	na	8.1E-02	ī	t	na	8.1E-02	:	1	na	8.1E-02

VA0061379_MSTRANTI_June_08.xls - Freshwater WLAs

page 3 of 4

												9		A. A. A.	Amorphopol	and it could		2	paritimi I tool	Allocation	
Parameter	Background	4	Water Qu	Water Quality Criteria		4	Wasteload Allocations	Allocations	1		Antidegradation baseline	n Baseline	3	And	Change and Allocations	Allocations (DM/C)	3	N Of the N	⋾⊢	Allocation I	27
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	_	Acute	Chronic HH (PWS)	_	E	e	Curonic and (PWS)	_	E Lo	1	Childric Prvs)	4		Η	2	(cyva) nn	nn
Ethylbenzene	0	£	F	na	2.9E+04	ı	1.	na	2.9E+04	1	1	na	2.9E+03	1	1	na	2.9E+03	:	1	na	2.9E+03
Fluoranthene	0	1	1	na	3.7E+02	1	1	na	3.7E+02	I		па	3.7E+01	1	1	na	3.7E+01	1	1	na	3.7E+01
Fluorene	0	1	3	na	1.4E+04	1	î	na	1.4E+04		î	na	1.4E+03	1	1	na	1.4E+03	1	ï	na	1.4E+03
Foaming Agents	0	1	1	na	ī	Î	ï	na	ī	1	E	na	T	ï	L	na	E	ī	į.	па	:
Guthion	0	1	1.0E-02	na	ř	į.	1.2E-02	na	î	1	2.5E-03	na	1	Ţ	2.9E-03	na	1	1	2.9E-03	na	:
Heptachlor ^c	0	5.2E-01	3.8E-03	na	2.1E-03	5.6E-01	4.4E-03	na	2.1E-03	1,3E-01	9.5E-04	na	2.1E-04	1.4E-01	1.1E-03	na	2.1E-04	1.4E-01	1.1E-03	na	2.1E-04
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	na	1.1E-03	5.6E-01	4,4E-03	na	1.1E-03	1.3E-01	9.5E-04	na	1.1E-04	1.4E-01	1.1E-03	na	1.1E-04	1.4E-01	1.1E-03	па	1.1E-04
Hexachlorobenzene ^c	0	1	I	na	7.7E-03	1	1	na	7.7E-03	ı	ı	na	7.7E-04	ī	t	na	7.7E-04	ī	ī	na	7.7E-04
Hexachlorobutadiene ^C	0	Ī	1	na	5.0E+02	ŧ	1	na	5.0E+02	ţ	ī	na	5.0E+01	ï	1	na	5.0E+01	i	ı	na	5.0E+01
Hexachlorocyclohexane	c)	8	0	1 20.01	3	9	en c	1 3E_01		,		1 3F-02	1	1	8	13F-02			na	1.3E-02
Hexachlorocyclohexane)			1				!	1												
Beta-BHC	0	£	Ð	na	4.6E-01	1	ī	na	4.6E-01	1	t	na	4.6E-02	1	ı	na	4.6E-02	1	1	na	4.6E-02
Hexachlorocyclohexane Gamma-BHC ^c (Lindane)	0	9.5E-01	na	na	6.3E-01	1.0E+00	ì	na	6.3E-01	2.4E-01	ř	na	6.3E-02	2.6E-01	t	na	6.3E-02	2.6E-01	1	na	6.3E-02
Hexachlorocyclopentadiene	0	3	9	na	1.7E+04	1	1	na	1.7E+04	ı	ī	na	1.7E+03	1	E	na	1.7E+03	1	ï	na	1.7E+03
Hexachloroethanec	0	1	1	na	8.9E+01	1	1	na	8.9E+01	į.	È	na 8	8.9E+00	ľ.	ŧ	na	8.9E+00	r	Ē	na	8.9E+00
Hydrogen Sulfide	0	E	2.0E+00	na	1	1	2.3E+00	na	Í	1	5.0E-01	na	1	1	5.8E-01	na	a	1	5.8E-01	na	;
Indeno (1,2,3-cd) pyrene ^c	0	E	1	na	4.9E-01	t	1	na	4.9E-01	,1	1	na	4.9E-02	ī	1	na	4.9E-02	1	1	na	4.9E-02
Iron	0	9	1	na	ī	ì	í	na	I		1	na	1	í	1	na	ī	ī	ı	na	:
sophorone ^C	0	3(1	na	2.6E+04	î	Ī	na	2.6E+04	Ţ	ï	na	2.6E+03	Ę	E	na 2	2.6E+03	ř	f	na	2.6E+03
Kepone	0	ŧ	0.0E+00	na	ï	Ē	0.0E+00	na	ř.	-	0.0E+00	na	1		0.0E+00	na	1	1	0.0E+00	na	1.3
Lead	0	2.0E+01	2.3E+00	na	ı	2.2E+01	2.7E+00	na	1	5.1E+00 (5.8E-01	na	1	5.5E+00	6.7E-01	na	1	5.5E+00	6.7E-01	na	:
Malathion	0	1	1.0E-01	na	ì	î	1.2E-01	na	1	1	2.5E-02	na	:	1	2.9E-02	па	1	ı	2.9E-02	na	:
Manganese	0	3	3	na	1	1	1	na	1	1	1	na	ı	į	£	na	ï	:	ı	na	1
Mercury	0	1.4E+00	7.7E-01	na	5.1E-02	1.5E+00	9.0E-01	na	5.1E-02	3.5E-01	1.9E-01	na	5.1E-03	3.8E-01	2.2E-01	na	5.1E-03	3.8E-01	2.2E-01	na	5.1E-03
Methyl Bromide	0	E	t	na	4.0E+03	t	1	na	4.0E+03	1	1	na ,	4.0E+02	1	1	na ,	4.0E+02	1	1	na	4.0E+02
Methoxychlor	0	1	3.0E-02	na	1	ī	3.5E-02	na	1	1	7.5E-03	na	1	j	8.8E-03	na	ī	1	8.8E-03	na	ı
Mirex	0	Ü	0.0E+00	na	1	1	0.0E+00	na	1	1	0.0E+00	na	Ť	1	0.0E+00	Па	ř	1	0.0E+00	na	ı
Monochlorobenzene	0	1	1	na	2.1E+04	1	ı	na	2.1E+04	1	t	na	2.1E+03	į	E	na	2.1E+03	1	ı	na	2.1E+03
Nickel	0	5.6E+01	6.3E+00	na	4.6E+03	6.1E+01	7.3E+00	na	4.6E+03	1.4E+01	1.6E+00	na	4.6E+02	1.5E+01	1.8E+00	na ,	4.6E+02 1	1.5E+01	1.8E+00	na	4.6E+02
Nitrate (as N)	0	18	ı	na	t	1	I	na	1	1	1	na	î	1	1	na	ĭ	ı	1	na	1
Nitrobenzene	0	1	1	па	1.9E+03	ì	1	na	1.9E+03	1	I	na	1.9E+02	1	1	na	1.9E+02	ì	1	na	1.9E+02
N-Nitrosodimethylamine ^C	0	Ü	1	na	8.1E+01	t	1	na	8.1E+01	1	I	na 8	8.1E+00	į	E	na 8	8.1E+00	ī	t	na	8.1E+00
N-Nitrosodiphenylamine ^C	0	ī	ı	na	1.6E+02	1	1	na	1.6E+02	£	Ė	na 1	1.6E+01	1	1	na 1	1.6E+01	1	1	na	1.6E+01
N-Nitrosodi-n-propylamine ^C	0	ī	E	na	1.4E+01	f	ť	na	1,4E+01	1	1	na 1	1.4E+00	1	1	na 1	1.4E+00	ì	1	na	1.4E+00
Parathion	0	6.5E-02	1.3E-02	na	1	7,0E-02	1.5E-02	na	1	1.6E-02	3.3E-03	na	1	1.8E-02	3.8E-03	na	î	1.8E-02	3.8E-03	na	:
PCB-1016	0	3	1.4E-02	na	1	Ĭ	1.6E-02	na	ï	1	3.5E-03	na	î	1	4.1E-03	па	i	į.	4.1E-03	na	1
PCB-1221	0	1	1.4E-02	na	I	ı	1.6E-02	na	Ţ	ı	3.5E-03	na	Ĕ	ı	4.1E-03	na	1	1	4.1E-03	na	1
PCB-1232	0	î	1.4E-02	na	I	ī	1.6E-02	na	ı	ı	3.5E-03	na	1	1	4.1E-03	na	1	1	4.1E-03	na	1
PCB-1242	0	Ē	1.4E-02	na	t	Í	1,6E-02	na	1	1	3.5E-03	na	1	ı	4.1E-03	na	1	ı	4.1E-03	na	ı
PCB-1248	0	1	1.4E-02	na	ī	î	1.6E-02	na	1	1	3.5E-03	na	ì	ı	4.1E-03	na	1	ı	4.1E-03	na	Ü
PCB-1254	0	3	1.4E-02	na	1	Î	1.6E-02	na	1	ľ	3.5E-03	na	ř	I.	4.1E-03	na	1	1	4.1E-03	na	:
PCB-1260	0	ī	1.4E-02	a	ī	Î	1.6E-02	na	ı	1	3.5E-03	na	1	ļ	4.1E-03	na	1	:	4.1E-03	na	1
PCB Total ^C	0	1	t	na	1.7E-03	1	I	na	1.7E-03	T	t	na	1.7E-04	1	1	na	1.7E-04	1	:	na	1.7E-04

Attachment 5E

VA0061379_MSTRANTI_June_08.xls - Freshwater WLAs

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Parameter	Background		Water Quality Criteria	ty Criteria			Wasteload Allocations	Allocations		Þ	Antidegradation Baseline	Baseline 1		An	Antidegradation Allocations	Allocations	100		Most Limitin	Most Limiting Allocations	ns
(ug/l unless noted)	Conc.	Acute	Chronic	Chronic HH (PWS)	Ŧ	Acute	Chronic HH (PWS)	IH (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic HH (PWS)	H (PWS)	Ŧ	Acute	Chronic	HH (PWS)	H
Pentachlorophenol ^c	0	1.0E+01	6,1E+00	na	8.2E+01	1.1E+01	7.2E+00	na	8.2E+01	2.5E+00	1.5E+00	na	8.2E+00	2.8E+00	1.8E+00	па	8.2E+00	2.8E+00	1.8E+00	na	8.2E+00
Phenol	0	ı	1	na	4.6E+06	1	ī	na	4.6E+06	ı	E	na	4.6E+05	E	I	na	4.6E+05	:	1	na	4.6E+05
Pyrene	0	t	1	na	1.1E+04	ť	()	па	1.1E+04	1	1	na	1.1E+03	1	î	па	1.1E+03	1	1	na	1.1E+03
Radionuclides (pCi/l except Beta/Photon)	0	1	I	na	t	t	Ē	па	i	f	f	na	ı	1	Ī	na	ŧ	1	1	na	1
Gross Alpha Activity	0	:	1	na	1.5E+01	1	1	na	1.5E+01	1	1	na	1.5E+00	1	1	na	1.5E+00	1	1	na	1.5E+00
Beta and Photon Activity (mrem/yr)	0	1	I	na	4.0E+00	ı	Ĩ	na	4.0E+00	1	E	na	4.0E-01	ī	ī	na	4.0E-01		:	na	4.0E-01
Strontium-90	0	I	I	na	8.0E+00	Ð	É	na	8.0E+00	Î	E	na	8.0E-01	1	ï	па	8.0E-01	1		na	8.0E-01
Tritium	0	1	I	na	2.0E+04	1	Ü	na	2.0E+04	Ť	1	na	2.0E+03	1	4	na	2.0E+03	1	1	na	2.0E+03
Selenium	0	2.0E+01	5.0E+00	na	1,1E+04	2.2E+01	5.8E+00	na	1.1E+04	5.0E+00	1.3E+00	na	1.1E+03	5.4E+00	1.5E+00	na	1.1E+03	5.4E+00	1.5E+00	na	1.1E+03
Silver	0	3.2E-01	3	na	1	3.4E-01	1	na	ī	7.9E-02	ı	na	1	8.6E-02	ı	na	£	8.6E-02	Ē	na	E
Sulfate	0	1	1	па	ı	1	ï	na	1	î	E	na	1	Ü	ľ	na	1	1	ı	na	1
1,1,2,2-Tetrachloroethane ^c	0	I	1	na	1.1E+02	1	Ē	na	1.1E+02	1	1	na	1,1E+01	1	1	na	1.1E+01		:	na	1.1E+01
Tetrachloroethylene ^C	0	1	1	na	8.9E+01	1	1	na	8.9E+01	ï	1	na	8.9E+00	1	Ī	na	8.9E+00	ı	1	па	8.9E+00
Thallium	0	1	1	na	6.3E+00	1	ī	na	6.3E+00	ī	;	na	6.3E-01	ī	ī	na	6.3E-01	f	1	na	6.3E-01
Toluene	0	1	1	na	2.0E+05	1	Î	na	2.0E+05	î	ı	na	2.0E+04	Ē	ī	na	2.0E+04	1	1	na	2.0E+04
Total dissolved solids	0	;	ţ	na	Ü	1	ŧ	na	l.	1	1	na	1	ì	1	na	ij	1	1	na	1
Toxaphene ^c	0	7.3E-01	2.0E-04	na	7.5E-03	7.9E-01	2.3E-04	na	7.5E-03	1.8E-01	5.0E-05	na	7.5E-04	2.0E-01	5.8E-05	na	7.5E-04	2.0E-01	5.8E-05	na	7.5E-04
Tributyltin	0	4.6E-01	6.3E-02	na	1	5.0E-01	7.4E-02	na	1	1.2E-01	1.6E-02	na	ı	1.2E-01	1.8E-02	na	ı	1.2E-01	1.8E-02	na	:
1,2,4-Trichlorobenzene	0	1	1	na	9.4E+02	1	ï	na	9.4E+02	ī	Ē	na	9.4E+01	ľ	ľ	па	9.4E+01	1	ı	na	9.4E+01
1,1,2-Trichloroethane ^c	0	1	ī	na	4.2E+02	Ē	Ē	na	4.2E+02	1	1	na	4.2E+01	1	1	na	4.2E+01	1	1	па	4.2E+01
Trichloroethylene ^c	0	1	ı	na	8.1E+02	1	1	na	8.1E+02	1	1	na	8.1E+01	1	1	na	8.1E+01	ì	ī	na	8.1E+01
2,4,6-Trichlorophenol ^c	0	1	1	na	6.5E+01	a	ű	na	6.5E+01	I	1	na	6.5E+00	ī	I	па	6.5E+00	ı	1	na	6.5E+00
2-(2,4,5-Trichlorophenoxy)	0	1	1	na	1		1	na	1	ī	1	na	ı	í	1	na	:	ı	ı	na	1
Vinyl Chloride ^c	0	1		na	6.1E+01	I	ī	na	6.1E+01	1	ž	na	6.1E+00	ī	1	na	6.1E+00	£	ı	na	6.1E+00
Zinc	0	3 6F+01	3 6F+01	e	6.9E+04	3.9E+01	4.3E+01	na	6.9E+04	9.1E+00	9.1E+00	na	6.9E+03	9.8E+00	1.1E+01	na	6.9E+03	9.8E+00	1.1E+01	na	6.9E+03

Attachment 5E

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- 1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- 2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- 3. Metals measured as Dissolved, unless specified otherwise
 - 4. "C" indicates a carcinogenic parameter
- 5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
- Antidegradation WLAs are based upon a complete mix.
- 6. Antideg, Baseline = (0.25(WQC background conc.) + background conc.) for acute and chronic
 - = (0.1(WQC background conc.) + background conc.) for human health
- 7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens,
 - Harmonic Mean for Carcinogens, and Annual Average for Dioxin. Mixing ratios may be substituted for stream flows where appropriate.

Metal	Target Value (SSTV)	Target Value (SSTV) Note: do not use QL's lower than the
Antimony	4.3E+02	minimum QL's provided in agency
Arsenic	2.6E+01	guidance
Barium	na	
Cadmium	6.7E-02	
Chromium III	4.2E+00	
Chromium VI	1.7E+00	
Copper	3.9E-01	
Iron	na	
Lead	4.0E-01	
Manganese	na	
Mercury	5.1E-03	
Nickel	1.1E+00	
Selenium	8.8E-01	
Silver	3.4E-02	

3.9E+00

Zinc

Attachment 5F- STATS.exe Output Data

Facility = VA0061379 VDOT I-85 Chemical = Ammonia - Annual Chronic averaging period = 30 WLAa = 3.2 WLAc = 0.65 Q.L. = 0.2 # samples/mo. = 1 # samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity Maximum Daily Limit = 1.3114855607206 Average Weekly limit = 1.3114855607206 Average Monthly Llmit = 1.3114855607206

The data are:

9

Facility = VA0061379 VDOT I-85 Chemical = Ammonia - Winter Chronic averaging period = 30 WLAa = 3.2 WLAc = 1.3 Q.L. = 0.2 # samples/mo. = 1 # samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity Maximum Daily Limit = 2.6229711214412 Average Weekly limit = 2.6229711214412 Average Monthly Llmit = 2.6229711214412

The data are:

9

Attachment 5F VA0061379 – STATS.exe Output

4/16/2008 10:17:21 AM

Facility = VA0061379 - VDOT I-85 Brunswick Rest Chemical = TRC Chronic averaging period = 4 WLAa = 0.0051 WLAc = 0.0032 Q.L. = 0.10 # samples/mo. = 30 # samples/wk. = 7

Summary of Statistics:

observations = 1
Expected Value = 20
Variance = 144
C.V. = 0.6
97th percentile daily values = 48.6683
97th percentile 4 day average = 33.2758
97th percentile 30 day average = 24.1210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 4.68023930897034E-03
Average Weekly limit = 2.85825587531232E-03
Average Monthly LImit = 2.31962565349114E-03

The data are:

20



Reduced Monitoring Frequencies:

Permittees having exemplary operations that consistently meet permit requirements are considered for reduced monitoring per the VPDES Permit Manual and in accordance with EPA's "Interim Guidance for Performance-Based Reduction of NPDES Permit Monitoring Frequencies" (EPA 833-B-96-001). In order to determine if the permittee qualifies for reduced monitoring frequencies, the three year composite average concentration is calculated for Outfall 001 for most parameters based on the DMR data in Attachment 5C. All concentration data below QL was treated as zero for purposes of determining reduced monitoring eligibility. The composite average is compared to the permit limitation to calculate a ratio of the average to limitation. Using the ratio and the baseline monitoring frequency as determined in the Sampling Schedule Table in the VPDES Manual Section MN-2 A.3, reductions in monitoring frequencies are determined by the Reduction Monitoring Frequency table in VPDES Manual Section MN-2 A.6.b.

Parameter	3-yr Average Concentration (mg/L)	Permit Limitation (mg/L)	Ratio of Average to Limitation	Baseline Monitoring Frequency ¹	Eligible Reduction in Monitoring Frequency
BOD ₅	3.97	20	0.20	Once per Month	Once per 6 months
TSS	8.40	30	0.28	Once per Month	Once per quarter

Ammonia: The facility is not eligible for reduced monitoring frequency for ammonia because of the change in the defined months for summer and winter for the ammonia limitations. The facility has not yet demonstrated the ability to meet the ammonia limitations with the shifted seasonal months. Reduced monitoring frequency eligibility will be re-evaluated during the next permit re-issuance.

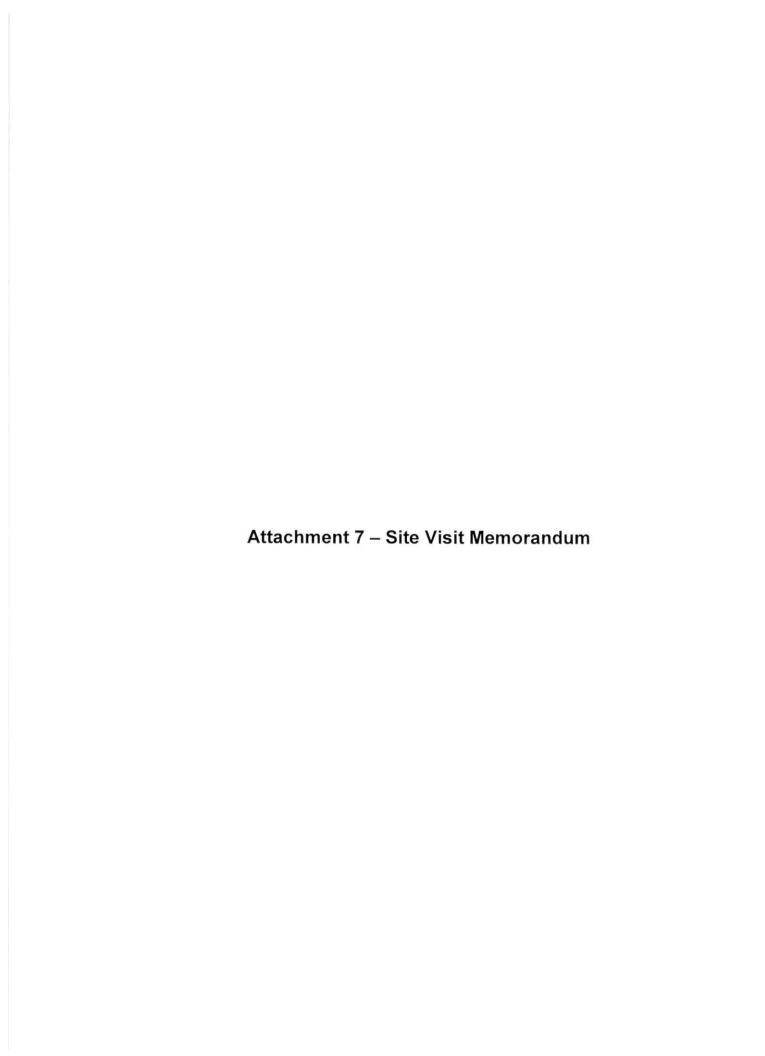
Dissolved Oxygen: Passive post-aeration systems, such as cascade steps, are eligible for the reduction of monitoring frequencies on a case-by-case basis. This facility has active diffused aeration consisting of a set of blowers that provide the air for the diffusers. Therefore, the facility is not eligible for reduced monitoring frequency for dissolved oxygen.

pH: In order to qualify for reduced pH monitoring, the pH can not be directly adjusted by chemical addition. Reduced monitoring is also not allowed where the minimum or maximum pH fall within 0.5 units of the permit limits. The facility does not directly adjust pH by chemical addition. The maximum pH limitation for the facility is 9.0 S.U. On eight occasions over the last three years, the pH measured was 8.5 S.U. Therefore, the facility does not quality for reduced monitoring of pH.

Discussion: The monitoring frequency for TSS is eligible for reductions from once per month to once per quarter. The monitoring frequency for BOD_5 is eligible for reductions from once per month to once per six months. The permit requires the return to the baseline monitoring if the permittee fails to maintain the performance levels that are used to grant these reductions.

² TRC was not evaluated for reduced monitoring frequency. To ensure protection of aquatic life and human health, disinfection and dechlorination parameters are not eligible for reduced monitoring.

¹ Baseline Monitoring Frequency is the level of monitoring in the existing permit.





MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office

4949-A Cox Road, Glen Allen, Virginia 23060-6295

File

804/527-5020

TO:

FROM: Jaime Bauer, Water Permit Writer

DATE: May 7, 2008

SUBJECT: Site Visit VA0061379 – VDOT I-85 Brunswick Rest Area

Cc: Charlie Stitzer, Water Compliance Inspector Jennifer Palmore, Water Quality Planner

On Tuesday May 6, 2008, Jennifer Palmore and I met with site operator Mr. Jeff Swenson and VDOT consultant Mital Patel, Timmons Group at the I-85 Brunswick Rest Area located at mile marker 31 on the northbound side of I-85. The VPDES permit for this facility will expire on October 19, 2008. Mr. Swenson provided us with a tour of the plant. All equipment appeared to be in working and order, and no problems were observed. The lagoon pond was algae-free and no duck weed appeared around its banks.

We then walked with Mr. Swenson to the outfall location, located east of the plant. The plant discharges to an unnamed tributary of Sturgeon Creek. Little to no flow was observed from the outfall pipe. The water level in the creek appeared to be about 2 feet deep and the creek width at the outfall location was approximately 4 feet. The creek water appeared tea colored which is typical for waters of the Chowan basin. No algae or other problems were observed at the outfall location.

There was no sampling performed or review of onsite records.

Attachment 8 – Stream Monitoring Data Analysis – Sturgeon Creek, UT

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060-6296

804/527-5020

SUBJECT:

Stream Monitoring Data Analysis - Sturgeon Creek, UT

VDOT I-85 Rest Area discharge (VA0061379)

TO:

Jaime Bauer

FROM:

Jennifer Palmore, P.G. 11

DATE:

April 23, 2008

COPIES:

Curt Linderman, Mark Alling, Model File

A request for analysis of stream monitoring data for an unnamed tributary of Sturgeon Creek was received on March 14, 2008. The monitoring was conducted by the Virginia Department of Transportation to evaluate the effect of the I-85 Brunswick Rest Area discharge. The permittee has submitted instream monitoring results taken monthly during the period January 2004 through January 2008.

Background

The rest area discharge was originally modeled by Drun-sun Lee on October 17, 1975 using the Monroe Model. The modeler applied the DEQ's antidegradation policy and allowed a maximum 0.2 mg/L drop in dissolved oxygen. The following effluent limits were recommended and are still in effect:

Flow

36,000 apd

BOD₅

20 mg/L Total Suspended Solids 20 mg/L

Dissolved Oxygen

6.5 mg/L minimum

However, the model used a background 7Q10 low flow of 1.0 cfs in determining the limits. During the 2003 permit reissuance, it was determined that background low flow has since been considered to be much less than 1.0 cfs. A 7Q10 of 0 cfs was used in the 2003 reissuance and the current analysis determines a 7Q10 flow of 0.010 cfs (J. Palmore memo dated 3/18/2008). Due to the discrepancy between the model and subsequent flow frequency determinations, the 2003 permit included a special condition requiring the facility to perform instream water quality monitoring on the unnamed tributary to Sturgeon Creek.

The permittee submitted the monitoring plan for review on December 17, 2003. The plan was approved by DEQ water planning staff (O. Shehab memo dated 2/27/2004). The stations are located at the following:

Station #1 - 100 feet upstream of the outfall

Station #2 - 3513 feet / 0.66 miles downstream of the outfall at the Rt. 642 bridge

Station #3 - 10213 feet / 1.95 miles downstream of the outfall at the Rt. 606 bridge in Rocky Ford

Results

The results of the monitoring program have been plotted and analyzed using a paired two-sample Student's Ttest to determine if the means of the upstream and downstream stations are equal. Refer to the attached analyses.

All upstream biochemical oxygen demand (BOD $_5$) values were at or below the quantification limit of 5.0 mg/L. The downstream stations were at or below 5.0 mg/L except on one occasion in October 2007 when the BOD $_5$ was 6 mg/L at Station #2 and 8 mg/L at Station #3.

All pH values upstream and downstream of the discharge were within the Water Quality Standard of 6.0-9.0 SU. A Student's paired T-test indicates that the downstream stations have a statistically significant higher mean than the upstream station. However, most values ranged from 6.0 to 7.0 SU, so the higher values would be closer to a neutral pH and would therefore not be of concern.

There were no violations of the maximum temperature Water Quality Standard of 32°C at any station. However, there were two dates in September 2004 where the temperature at Station #2 was more than 3°C higher than the upstream background station, which is a violation of the water quality standards. The mean temperature was also deemed statistically higher than the upstream station (mean of 14.6 versus 14.9). Station #3 was not analyzed for the temperature increase because any temperature effect on the stream would be maximized at the outfall and would not be expected to have an increasing influence downstream.

Station #2 has a higher dissolved oxygen level than the upstream station as indicated by the Student's Ttest. There were no violations of the dissolved oxygen water quality standard at Station #2, which would imply that the facility does not have an adverse impact on dissolved oxygen at that location. However, there were two dates when the dissolved oxygen percent saturation exceeded 125% even though the upstream station was within the appropriate range (although elevated) - 140% in April 2005, and 131% in March 2006. Supersaturation can be an indicator of nutrient overenrichment causing algal growth. On both occasions, dissolved oxygen at Station #2 was approximately 14 mg/L.

The mean dissolved oxygen at station #3 is not statistically different than the upstream station. Although there were several days when the dissolved oxygen at Station #3 violated the 4.0 mg/L instantaneous minimum dissolved oxygen violation standard, the majority of those days the stream was either below the 7Q10 and the water quality standard did not apply, or the upstream station was also in violation. However, there appears to be one date of concern; in November 2006, the dissolved oxygen at Station #3 was only 3.98 mg/L (35% saturation), even though Stations #1 and #2 had dissolved oxygen values of 9.06 and 9.81 mg/L, respectively (81% and 87% saturation). The maximum effluent flow during the study period was in November 2006 (0.0251 MGD), which was in the same month as the low dissolved oxygen reading, however the BOD₅ was <QL for the same month.

Recommendations

The monitoring confirmed that the tributary experiences occasional violations of the dissolved oxygen standard during low flow summer months, however the violations were <10% of the samples and the stream would not be considered impaired. There are multiple dates where there is a greater than 0.2 mg/L drop in dissolved oxygen from the upstream station; however, many of these samples were taken during months where the DMR states that the BOD_5 in the discharge was <QL; therefore it is not possible to positively determine that the drop is caused by the discharge. In fact, as stated above, the mean dissolved oxygen is actually higher at Station #2 than at the upstream station.

Based on review of the data, I do not believe that the facility caused an obvious negative impact on the receiving stream during the study period. However, it is difficult to extrapolate between the study period (during which the STP released a high-quality effluent that averaged a DO of 8.26 mg/L and a BOD $_5$ <QL at an average flow of only 0.00767 MGD) and the worst-case situation of low flow 7Q10 stream conditions and discharge at maximum effluent limit and full design flow. However, I do not recommend re-modeling the discharge at this time and the instream monitoring program may be discontinued.

If you have any questions or need any additional information, please do not hesitate to contact me.

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- Downstream	DO - mg/L	12.49	13.61	12.15	11.54	10.92	11.05	40.23	0.00	44.00	68.1	97.5	- 0	9.65	9.29	9.37	8.58	8.92	7.58	6.72	7.04	7.24	7.38	7.42	6.9	6.81	6.13	7.96	6.34	6.97	6.94	7.15	7.02	5.36	7.18	5.89	7.78	9.64	7 17	1	107	10.00	10.09	10.13	10.35	10.3	10.93	12.29	12.68	9.43	
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9/2/05

2/17/05

1-Upstream
 2-Downstream
 3-Downstream

3-Downstream	Aeans	Variable 1	0.883 0.883 0.883 0.893 0.900 0.185 1.663 0.371
DO between 1-Upstream and 3-Downstream	t-Test: Paired Two Sample for Means		Mean Variance Observations Pearson Correlation Hypothesized Mean Difference of t Stat P(T<=t) one-tail P(T<=t) mo-tail P(T<=t) mo-tail
		Variable 2	0. 0. 0. 0. 0. 0.
2-Downstrean	Means	Variable 1	6.8 6.8 8 0.882 0 85 -5.359 3.523E-07 1.663 7.047E-07
DO between 1-Upstream and 2-Downstream	t-Test: Paired Two Sample for Means	Mean	Variance Observations Pearson Correlation Hypothesized Mean Difference of C Stat P(T<=!) one-tail P(T<=!) two-tail P(T<=!) two-tail Critical fear-tail

Near Nations 2 Near Near
1.663 so reject H ₀ that means are equal

 t_{tag} =-0.900<1.663 & >-1.663 so cannot reject H $_0$ that means are equal P(T<=t) is not statistically significant (0.185>0.05)

s positive if the first mean is larger than the second and negative if it is smaller, therefore the upstream site than the two downstream sites, as shown in "Variable 2 mean".

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n 1-Upstream and 2-Downstream

	Variable 1	Variable 2
Mean	14.6	14.9
Variance	38.3	43.1
Observations	80	80
Pearson Correlation	0.989	
Hypothesized Mean Difference	0	
df df	79	
t Stat	-2.452	
P(T<=t) one-tail	0.008	
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P(T<=t) two-tail	0.016	
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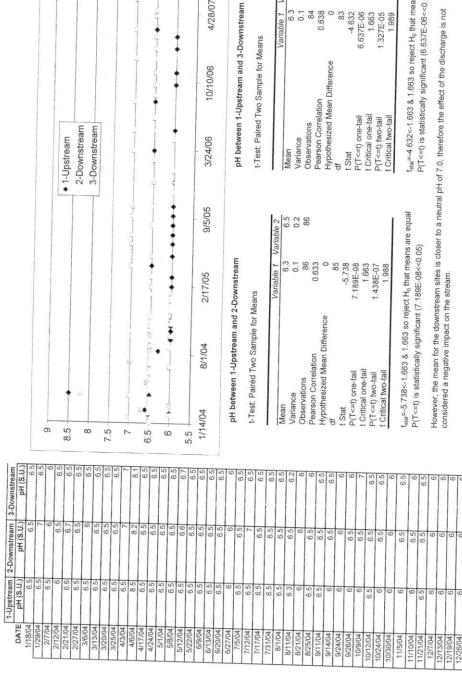
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102 174 1910 217/05 915/05 3/24/06 10/10/06 4/28/07 102 73 DO% Saturation between 1-Upstream and 2-Downstream 103 88 T-Test: Paired Two Sample for Means 104 105 10/20 10/20 10/20 10/20 105 10/20 10/20 10/20 10/20 105 10/20 10/20 10/20 10/20 105 10/20 10/20 10/20 105 10/20 10/20 10/20 105 10/20 10/20 10/20 105 10/20 10/20 10/20 105 10/20 10/20 10/20 105 10/20 10/20 10/20 106 10/20 10/20 10/20 106 10/20 10/20 10/20 106 10/20 10/20 10/20 107 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/20 10/	79	9 8	12				
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92 df 82 df 73 t Stat 73 t Stat 73 t Stat 73 t Stat 74 Stat 74 Stat 75 t Stat 76 P(Tr=t) one-tail 2.98E-07 1.664 Stat 797E-07 1.064 Stat 797E-07 1.069 93 1.064 Stat 7.067E-07 1.069 93 1.067 Statistically significant (2.398E-07 1.069 94 1.064 Statistically signistically signistically signistically signistically signistically sign	79	80	87	Hypothesized Mean Difference		Hypothesised Mean Difference	0.738
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89 86 (Critical one-fail 2.39E-7.7 (1664 8.1.6	88	7.3	7.0	1	00t.C	Coldi	-1.490
93 1 FOrtical two-tail 1,5654 93 91 FOrtical two-tail 1,5654 93 93 15 1 FORTICAL two-tail 1,5654 94 1,5654 80 reject H ₀ that means are equal 95 96 FOrtical is statistically significant (2,398E-07<-0.05)	S a	2 0	0 0	T(1 <=t) one-tall	Z.398E-07	P(T<=t) one-tail	0.070
93 91 t Critical two-tail 4.797E-07 93 93 1. t _{stall} =5.468<-1.664 & 1.664 so reject H ₀ that means are equal 95 96 P(T<=t) is statistically significant (2.398E-07<<0.05)	00	60	99	t Critical one-tail	1.664	t Critical one-tail	1.664
93 91 t Critical two-tail 1.989 93 93 (***) 1.548<-1.664 & 1.664 so reject H ₀ that means are equal 95 96 (77=t) is statistically significant (2.388E-07<-0.05)	000	98	81	P(T<=t) two-tail	4.797E-07	P(T<=t) two-tail	0.140
93 93 t _{sum} =-5.468<-1.664 & 1.664 so reject H ₀ that means are equal 95 96 P(T<=t) is statistically significant (2.398E-07<<0.05) 94 T	94	93	91	t Critical two-tail	1.989	t Critical two-tail	1 990
93 t _{sum} =5.468<-1.664 & 1.664 so reject H ₀ that means are equal 95 96 P(T<=t) is statistically significant (2.398E-07<<0.05) 99 7-	83	93	93				0000
95 96 P(T<=t) is statistically significant (2.388E-07<<0.05) 96 94 T-	82	91	93	t _{stn} =-5.468<-1.664 & 1.664 so	reject H _o that means are equal	t=-1 490<1 664 & >-1 664 so can	are second total H topian ton
96 98	91	96	96	D/T<=t) is etatistically significant	12 30 07 - 70 DB 07 - 10 DE 07 + 10	100 C	not reject 10 that means are
300	6	98	96	(1 t) is statistically significa	III (2.390E-07 <<0.03)	P(1 <=t) is not statistically significan	t (0.070>0.05)
The same of the sa	80	90	0	The 4 states of culture if the fire	and commence for function with the state of		

lower DO mean than the two downstream sites, as shown in "Variable 2 mean"

		_	3-Downstream	
DATE	"Saturation	"Saturation	"Saturation	
1/15/05	92	96	96	Take 1
1/17/05	93	26	96	
1/25/05	100	104	105	
2/16/05	103	121	118	
3/16/05	66	108	9	
4/18/05	117		112	
5/17/05		91	69	
6/22/05		86		
7/19/05		84		
8/16/05		73	62	
9/13/05				Several pariode of low flow but not 27040
10/10/05		80		Specific days in questions
11/23/05	74	86	85	
2/20/05	93	77	77	
1/23/06	93	96	76	
2/23/06				
3/23/06	117		95	
4/25/06	85	91	83	
5/22/06	82	78	99	
6/27/06	80	74	85	
2/1/06	78	86	74	
8/14/06	88	79	103	
9/4/06	91	96	89	
10/3/06	83	92	83	
11/7/06	81	87		
12/18/06	88	102	66	
1/16/07	96	100	06	
2/20/07	102	109	115	
3/12/07	110	93	111	
4/23/07	87	100	104	
5/7/07	89	96	87	
20/6/9	72	26	76	
70/917	63	63	16	
8/15/07	62	85	84	
9/18/07	74	84		<7010
10/24/07				Dariod of used low flow but about 70 to 20
11/20/07				< 70.10 < 70.10 on 10/23 to 11/4
1/8/08	63	85	78	
2/18/08	74	109	7.2	



11/14/07

4/28/07

10/10/06

	Variable 1	Variable 2
Mean	8	20
	9	0.0
Variance	0.1	0
Oheanotiona	5	5
COSCI VALIDITS	84	84
Pearson Correlation	0.638	
Hypothesized Mean Difference		
Paris morning morning and a second	0	
di.	83	
t Stat	A 632	
P/T<=t) one-tail	2007	
וו ו) סופ-נמוו	6.63/E-06	
t Critical one-tail	1.663	
P(T<=t) two-tail	1 327F-05	
t Critical two-tail	000	

 $t_{\text{stat}}\!\!=\!\!-4.632<\!\!-1.663$ & 1.663 so reject H_0 that means are equal $P(T\!<\!\!=\!\!1)$ is statistically significant (6.637E-06< $\!\!-0.05)$

2-Downstream 3-Downstream	-	9	9	9	9			6.5	7	7	6.5	7 Several periode of loss dos.	7 6.5 specific days in graphing	9		9	1	9	7	6.5	6.5		6.5	2	7		6.5	7	6.5	6.5	7	7	7.5	7 57010	7 Period of very law flow had a	
1-Upstream	pH (S.U.)		1/15/05			3/16/05 6	4/18/05 6.5		6/22/05	7/19/05 6					1/23/06	2/23/06 6.5	23/06 6.5					8/14/06 6.5	9/4/06 6.5	/3/06		1/16/07 6				5/7/07 6.5			8/15/07 6.5	9/18/07	.9	11/20/07

0 on 10/23 to 11/4

Attachment 9 - Temperature Data and Evaluation

ANNUAL DATA*

Year Date Temp 2005 7-Jan 11.4 2008 8-Jan 14.6 2007 16-Jan 12.2 2005 17-Jan 4.1 2006 23-Jan 8.3 2006 23-Jan 3.1 2004 29-Jan 3.1 2004 12-Feb 5.3 2004 12-Feb 5.2 2005 16-Feb 11.9 2008 18-Feb 14.6 2007 20-Feb 7 2004 21-Feb 11.9 2004 21-Feb 11.9 2004 21-Feb 5.3 2004 21-Feb 7 2004 21-Feb 5.3 2004 27-Feb 5.3 2004 21-Feb 11.1 2004 27-Feb 5.3 2004 13-Mar 11.4 2005 16-Mar 7.2 204 25-Mar <t< th=""><th></th><th>ANNUAL DATA*</th><th></th></t<>		ANNUAL DATA*	
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2007	18-Sep	Temp
		20.6
2004	24-Sep	17.8
2004	26-Sep	25.2
2006	3-Oct	15.1
2004	9-Oct	16.2
2005	10-Oct	17.3
2004	12-Oct	12.6
2007	24-Oct	12.3
2004	24-Oct	16.5
2004	30-Oct	17.2
2004	5-Nov	9.2
2006	7-Nov	9.8
2004	10-Nov	8.2
2007	20-Nov	11.6
2004	21-Nov	11.1
2005	23-Nov	7.3
2004	30-Nov	10
2004	7-Dec	9.7
2004	13-Dec	9
2006	18-Dec	9.5
2004	19-Dec	4.4
2005	20-Dec	3.7
2004	26-Dec	3.1

Annual Avg: 16.29683333 90th Percentile Annual: 24.33

^{*} Data collected monthly from January 2004 through February 2008.

WINTER DATA*

Date	Date	Year
11.4	7-Jan	2005
14.6	8-Jan	2008
6	15-Jan	2005
12.2	16-Jan	2007
4.1	17-Jan	2005
4.5	18-Jan	2004
8.3	23-Jan	2006
3.1	25-Jan	2005
3.1	29-Jan	2004
5.3	7-Feb	2004
5.2	12-Feb	2004
11.9	16-Feb	2005
14.6	18-Feb	2008
7	20-Feb	2007
11.11	21-Feb	2004
5.3	27-Feb	2004
15.1	6-Mar	2004
11.4	12-Mar	2007
18.4	13-Mar	2004
7.2	16-Mar	2005
12	20-Mar	2004
9.8	23-Mar	2004
15.1	3-Oct	2006
16.2	9-Oct	2004
17.3	10-Oct	2005
12.6	12-Oct	2004
12.3	24-Oct	2007
16.5	24-Oct	2004
17.2	30-Oct	2004
9.2	5-Nov	2004
9.8	7-Nov	2006
8.2	10-Nov	2004
11.6	20-Nov	2007
11.1	21-Nov	2004
7.3	23-Nov	2005
10	30-Nov	2004
9.7	7-Dec	2004
9	13-Dec	2004
9.5	18-Dec	2006
4.4	19-Dec	2004
3.7	20-Dec	2005
3.1	26-Dec	2004

90th Percentile Winter:

16.09

MONTHLY AVERAGES

Month	Monthly Avg Temp	Annual Avg Temp
Jan	7.47777778	15.28060847
Feb	8.63	15.28060847
Mar	12.31666667	15.28060847
Apr	15.9	15.28060847
May	17.48571429	15.28060847
Jun	20.58571429	15.28060847
Jul	24.43333333	15.28060847
Aug	23.01428571	15.28060847
Sep	22.675	15.28060847
Oct	15.31428571	15.28060847
Nov	9.6	15.28060847
Dec	6.566666667	15.28060847
A 1 A	15 00000000	

Annual Avg 15.33328704

^{*} Data collected monthly from January 2004 through February 2008.

